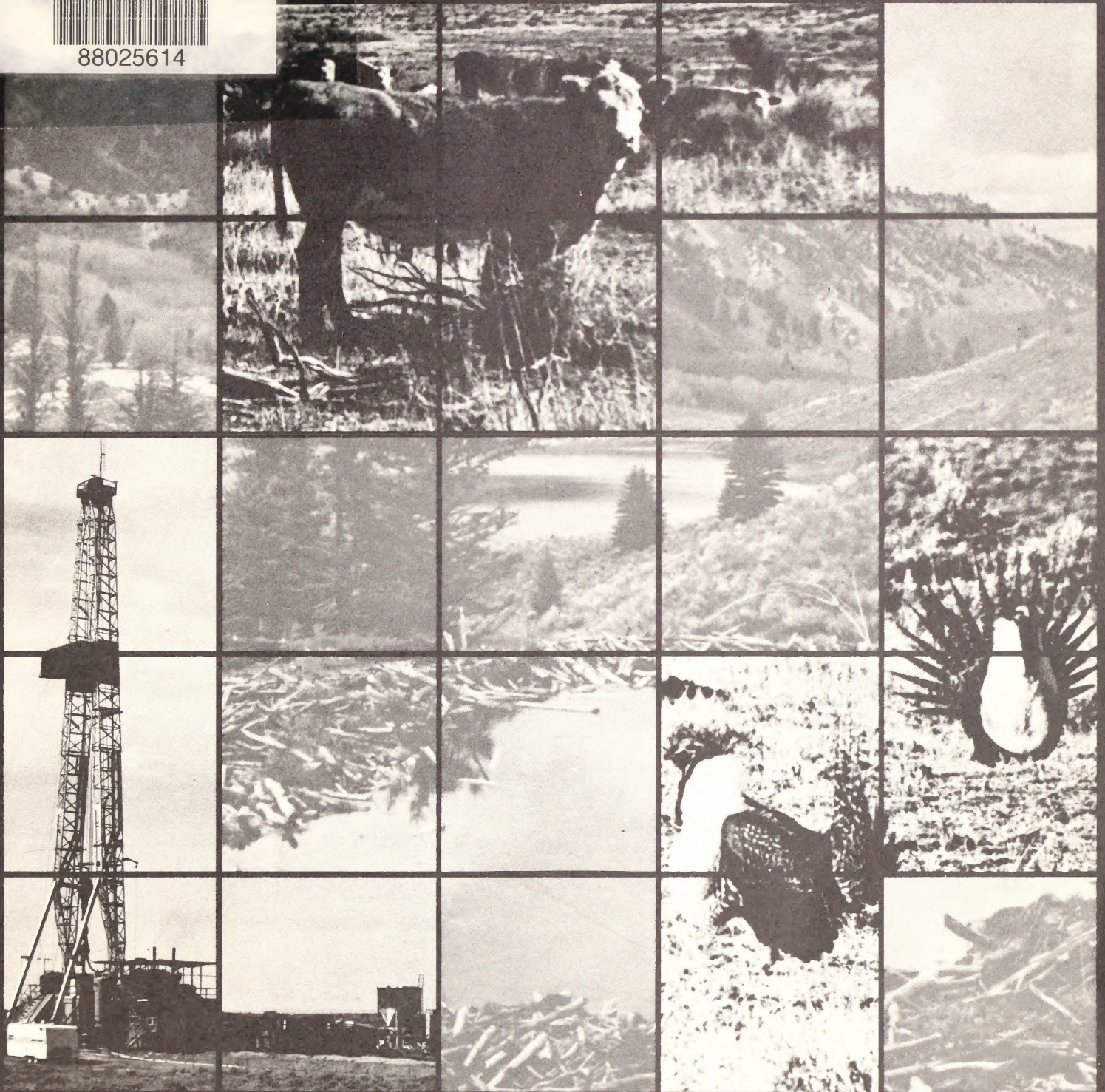


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Resource Management Plan Draft Environmental Impact Statement

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RESOURCE MANAGEMENT PLAN/ ENVIRONMENTAL IMPACT STATEMENT FOR THE KEMMERER RESOURCE AREA

Lincoln, Sublette, Sweetwater, and Uinta Counties, Wyoming

Lead Agency: Bureau of Land Management, U.S. Department of the Interior

Type of Action: Administrative

Abstract:

This draft Resource Management Plan and Environmental Impact Statement addresses alternatives for managing approximately 1.6 million surface acres administered by the Kemmerer Resource Area of the Bureau of Land Management. The alternatives focus primarily on resolving nine planning issues.

Six alternatives were examined in detail. Each of the six provides a different emphasis for managing the resource area and each resolves the nine planning issues.

When this document is produced in final form, it will provide a comprehensive framework for managing and allocating resources in the Kemmerer Resource Area during the next 20 years, or longer.

Further information regarding this document can be obtained from the address below. Comments, which will be accepted until July 12, 1985, will be addressed to:

Alan Stein, Team Leader
Rock Springs District Office
Bureau of Land Management
P.O. Box 1869
Rock Springs, Wyoming 82902-1869
Telephone (307) 382-5350



United States Department of the Interior

Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82001

March 1985

Dear Reader:

Enclosed for your review is the draft Resource Management Plan (RMP) and Environmental Impact Statement (EIS) for the Kemmerer Resource Area. It outlines several alternatives for managing the public land and mineral resources in the Kemmerer Resource Area. These alternatives are designed to resolve nine planning issues. The environmental consequences of the alternatives have also been analyzed.

Please review the document and direct any written comments to Alan Stein, Team Leader, Rock Springs District Office, P.O. Box 1869, Rock Springs, Wyoming 82902-1869. You have 90 days in which to review the document and submit comments. The 90-day period begins the day the Notice of Availability is published in the Federal Register.

All written and oral comments will be considered in the preparation of the final RMP/EIS. The final EIS may be prepared in an abbreviated format. An abbreviated final EIS would contain: a response to public comments; a summary of changes; and a description of the proposed plan. Therefore, this draft EIS should be retained for review with the final RMP/EIS when it is issued.

Thank you for your interest.

Sincerely yours,



State Director

Enclosure

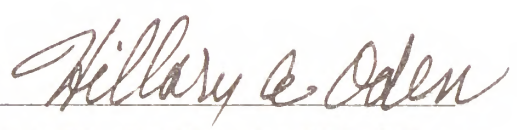
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**DRAFT
RESOURCE MANAGEMENT PLAN/
ENVIRONMENTAL IMPACT STATEMENT
FOR THE
KEMMERER RESOURCE AREA
KEMMERER, WYOMING**

Prepared By:
U.S. Department of the Interior
Bureau of Land Management
March 1985



State Director, Wyoming State Office

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Denver, CO 80225

SUMMARY

KEMMERER RESOURCE AREA

RESOURCE MANAGEMENT PLAN (RMP)

INTRODUCTION

The National Environmental Policy Act (NEPA) and the Bureau of Land Management's planning regulations, under Federal Land Policy and Management Act, require the evaluation and consideration of alternatives to proposed land use plans. Each alternative analyzed in detail represents a complete and reasonable plan which could be used to guide the management of the Kemmerer Resource Area (KRA).

SETTING

The KRA includes the cities of Kemmerer and Evanston and surrounding areas of southwestern Wyoming; the Star Valley area to the north; small portions of Bear Lake County, Idaho; and a part of Rich County, Utah. The areas outside of Wyoming are managed for range resources only. The KRA is approximately 75 miles from east to west and 130 miles from north to south, excluding Star Valley. Public land surface administered by BLM (1,633,000 acres) constitute 51 percent of this area plus 204,000 acres of Federal mineral estate.

ISSUES

The following issues were identified for the Kemmerer RMP:

1. There is conflict between geophysical exploration (with associated activities) and wildlife, range, and recreation.
2. There is conflict between development of oil and gas fields, including exploration drilling, and wildlife, range management, and recreation.
3. Industries that cause surface disturbing development are committed to reclamation of disturbed lands. However, the final use or condition of reclaimed areas is sometimes different than expected.

4. Changes in range management practices may be needed to address conditions that are presently below acceptable standards.
5. Wildlife habitat management adjustments may be needed to address conditions and practices which adversely impact key habitat.
6. Recreation management adjustments may be needed to provide adequate ORV management, and recognition of potential recreation opportunities. Management of the Raymond Mountain WSA must be identified if Congress decides not to designate it as a Wilderness Area.
7. There is a need for land sales and transfers of public land.
8. There is a lack of access to public lands, especially for forestry and recreation purposes.
9. Better management of utility and communication uses of public lands is needed.

ALTERNATIVES

All alternatives include an array of land use allocations and management practices that do not vary among alternatives. The alternatives considered but eliminated from detailed study were: (1) No Oil and Gas Leasing; (2) Areas of "No Surface Occupancy" Restrictions in the Most Crucial Parts of Big Game Winter Range; (3) No Livestock on Public Lands; and (4) Raymond Mountain Wilderness Study Area (WSA). Alternatives examined in detail were developed around a central concept for managing the resource area. They are as follows:

Existing Management This alternative would consider the continuation of current management direction. It would continue present management practices and levels of resource use. This alternative would reflect only the changes necessary to respond to the requirements of new regulations and

SUMMARY

changing national policies. This would be the "No Action" alternative.

Alternative A This alternative would emphasize a reduction in the restrictions on oil and gas exploration and development. Stipulations on where and when oil and gas related activities could take place would be limited, thereby facilitating development of the resource. Other management actions would be consistent with this objective and tend toward more intensive use of the resources of the KRA.

Alternative B This alternative would emphasize use of the public lands for grazing of livestock. Restrictions placed on livestock grazing would be minimized. Expenditures for range improvements would be greatest under this alternative. Mitigation measures for mineral development would be directed at benefitting livestock grazing.

Alternative C This alternative would be intended to achieve a greater degree of benefit to wildlife and watershed resources. Mineral exploration and development would have the greatest degree of restrictions of any alternative examined in detail. Mitigation measures would be directed at benefitting wildlife rather than livestock. Restrictions on use of riparian areas by livestock and by mineral development would also be intended to benefit watershed values by reducing erosion and salinity.

Alternative D This alternative would

provide that no forage from the public lands would be licensed to private operators. Grazing would still occur on public lands until existing permits expire. Restrictions on mineral exploration and development would be similar to Existing Management. This would be considered the "No Grazing" alternative.

Alternative E This alternative would represent a selection of proposed management actions which would resolve the planning issues and provide for multiple-use management of the public lands and resources so that they would be utilized in a combination that would meet present and future needs. No resource or resource user would be emphasized to the overall detriment of others. The need for development of mineral resources would be met. Means to mitigate adverse impacts of such development, without precluding it, would be identified. This would be the Bureau's preferred alternative.

ENVIRONMENTAL CONSEQUENCES

The impacts from Management Common to All Alternatives are summarized in Table S-1. The impacts from each of the alternatives are summarized in Table S-2.

TABLE S-1

ENVIRONMENTAL IMPACTS FOR MANAGEMENT COMMON TO ALL ALTERNATIVES

Air Quality	Geology and Minerals	Soils	Water Resources	Livestock Management and Vegetation
Adverse impacts from coal, trona, and construction activities.	Coal - 9.44 million tons of coal produced; 2,365 acres disturbed. Phosphate prospecting and mining claims are negligible. Sodium - 11.7 million tons of trona annually and up to a total of 15,200 acres disturbed.	Energy and mineral activities may cause adverse impacts to soils: accelerated wind and water erosion and mass wasting; decreased soil productivity. Coal development causes decreased productivity and irretrievable soil loss. Sodium/phosphate impacts are not significant. 6,160 acres stock trails; cause minimal soil compaction and decreased productivity. Wildlife habitat and riparian management stabilize and improve watershed cover and condition. Timber harvest impacts are minimal due to small acreages and use of Forest Management Plans. Erosion hazard in timbered areas with steep slopes and high rainfall.	Sodium - Some adverse impacts to groundwater and alteration of natural drainages. Coal - Increased salinity in some surface waters. Some impact to local groundwater supplies.	Mineral activity has negligible impact. Permanent roads reduce forage and increase conflicts with livestock. Weed and pest control programs beneficial to vegetation and livestock. Predator control significant economic benefit to sheep operators. Reduced competition for forage and reduced maintenance required from horse removal. Trails enhance supervision and limit adverse impacts to vegetation. Disturbance to livestock from occasional ORV.

TABLE S-1

Fish and Wildlife	Land Resources	Cultural Resources	Forestry Resources	Recreation
Some short-term losses of habitat and wildlife movement would occur.	Land Tenure Adjustment - Continue at the lowest level, removing acreage from livestock use.	Policy is to identify presence of cultural resources, if any, prior to allowing surface disturbance activities.	Mitigating measures on other actions result in minimal increases in operating costs.	RAMP for Oregon and Mormon Trails and Raymond Mountain will have beneficial impacts.
Disturbance to wildlife from energy and minerals exploration and development can displace wildlife from preferred habitat and disrupt reproductive activity. Activity adjacent to riparian areas can cause deterioration of fisheries habitat.	Rights-of-Way - Process with mitigations; reduce impacts to resources.	Adverse impacts occur from trespass actions, illegal collecting, and vandalism, inappropriate stipulations, failure to recognize or report important sites, and natural or accelerated erosion.		Access for logging operations may change primitive recreation values associated with natural areas.
Timber harvest can increase beneficial edge effect but may also have adverse impact where cover is limited, or near riparian areas.				Rights-of-way may be routed to preserve or provide access to sites with recreation potential.
Unrestricted ORV use reduces wildlife carrying capacity.				
Disposal of land could adversely affect habitat areas involved unless used to consolidate other agency acreage.				
Coal and sodium mining disturbances have been mitigated.				

TABLE S-2

COMPARISON OF IMPACTS BY ALTERNATIVE

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
AIR QUALITY					
Under worst case, short-term toxic emissions of H ₂ S may occur. Smoke from up to 5,000 acres of prescribed burning. Short-term impacts from oil and gas construction and drilling.	Highest probability of increasing air quality impacts and H ₂ S incidents. Impacts are the same as Existing Management except for: smoke from up to 82,610 acres of prescribed burning.	Lowest probability of H ₂ S emissions affecting populated areas. Smoke from up to 136,960 acres of prescribed burning.	Lowest probability of increasing air quality impacts. Toxic emissions same as Alternative B. Smoke from up to 33,500 acres of prescribed burning.	Toxic emissions same as Alternative B. No smoke from prescribed burning.	Toxic emissions same as Alternative B. Smoke from up to 82,610 acres of prescribed burning.
FIRE MANAGEMENT					
Full suppression of wildfires.	Suppression of wildfires with management options which may increase fire management costs and improve habitat.	Same as Alternative A. Same as Alternative A. Same as Alternative A. Same as Alternative A.			

TABLE S-2

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
GEOLOGY AND MINERALS					
Additional mitigations placed on leases as they are issued. Restrict development by application of NSO criteria.	Reduced impacts due to fewer NSO stipulations being placed on renewed leases.	Reduced impacts from Existing Management. More restrictive in lambing and land-slide areas.	NSO on slopes greater than 25%, wet and sub-irrigated areas, live water and historic trails.	Slightly higher costs to operator for reclamation. Remainder same as Existing Management.	Impacts from H ₂ S mitigation and land-slide-prone areas - same as Alternative B.
Additional acreage removed from leasing in the Raymond Mountain WSA.	Less acreage under NSO and removed from leasing. Raymond Mountain WSA opened for leasing if Congress does not designate this area wilderness.	Additional costs incurred by the operator for H ₂ S plans and reclamation and off-site mitigation to improve livestock would increase operating costs.	Delays in APDs due to wildlife stipulations.	Geophysical - Same as Existing Management but less restrictive on lambing areas.	Increased costs for offsite mitigation - less than Alternative C.
Costs incurred by the operator for drilling H ₂ S contingency plans and reclamation.	Congress does not designate this area wilderness. Decreased drilling costs. H ₂ S contingency plan costs would be the same as Existing Management.	Delays similar to Existing Management. Phosphate prospecting and mining claims same as in Existing Management.	87,809 acres would be withdrawn from leasing.	NSO costs for eagle roosting and riparian zones - same as Existing Management.	NSO costs for eagle roosting and riparian zones - same as Existing Management.
Geophysical - delays due to seasonal restrictions. Increased costs to companies for geophysical exploration in Raymond Mountain WSA.	Reduced reclamation costs.		Offsite mitigation for wildlife would increase costs to operators over Existing Management.	Geophysical - Impacts similar to Existing Management but less for sage grouse and lambing. Impacts from muddy area closures - same as Alternative B.	Geophysical - Impacts similar to Existing Management but less for sage grouse and lambing. Impacts from muddy area closures - same as Alternative B.
Limited impacts to placer mining activities.	Lower geophysical costs.		Geophysical - Most restrictive on geophysical lines, except for sage grouse areas.	Added expense for bridges.	Added expense for bridges.
			Most restrictive to placer mining in riparian areas.		More restrictive to placer mining than Existing Management but less than Alternative C.
			Limited impact to gravel sales.		

TABLE S-2

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
SOILS					
Incidents of vehicle damage on wet soils and at stream crossings.	Same as Existing Management except:	Same as Existing Management except:	Same as Alternative B except:	Same as Existing Management except:	Same as Alternative C except:
Soil loss from well pads - up to 110 to 270 tons/year/pad. Reclamation success is variable. Unsuccessful reclamation efforts have caused irretrievable soil loss.	Impacts would increase in duration and magnitude.	Reduced soil compaction and loss of ground cover.	Additional protection of streambank stability and reclamation success.	Reduced livestock use would increase ground cover and stabilize soils.	Reclamation success would be higher than existing management.
5,000 acres of vegetation manipulation would cause short-term increased erosion and long-term increased ground cover and stability.	No seasonal or surface occupancy restrictions would increase erosion and reduce streambank stability.	Reclamation would be more successful.	Impacts from grazing similar to Existing Management with increased allocation to watershed protection.	Lack of vegetative manipulation would cause continued erosion on 51,085 acres of degraded watershed.	Livestock grazing impacts would be similar to those under Alternative A.
5 AMPs would improve watershed condition.	Relaxed stream crossing stipulations would increase soil loss.	39 AMPs would greatly improve watershed conditions.	Overall watershed stability would increase.	HMPs and ACECs would remain protective of watershed values.	
Outside AMPs - Soil stability trends would continue at present levels.	Limited overall success of reclamation.	Range improvements and vegetation manipulation on 136,960 acres would increase short-term erosion and increase long-term benefits to soil.	HMPs and ACEC would provide high level of management and protection.		
Open/unlimited ORV use may cause significant erosion in some areas.	Raymond Mountain watershed would be open and soil erosion would accelerate.	Livestock in riparian zones in spring would cause more erosion and soil compaction than Existing Management.			
ORV closures would provide protection in Raymond Canyon and IGO Speedway.	23 AMPs would improve watershed conditions.				
	82,610 acres of vegetation manipulation would expand long-term benefits.				

TABLE S-2

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
WATER RESOURCES					
Geophysical - Short-term increase in sedimentation. Minimal impacts to groundwater from shoetholes.	Surface water - sedimentation more than Existing Mgmt. Increased impacts to water quality due to disturbance during wet seasons and in riparian areas. Increased salinity. Increased sedimentation due to reduction in seasonal stipulations.	Surface water - adverse impacts from oil and gas actions less than Existing Management. Increased impacts from sedimentation due to long-term impacts from unrestricted grazing in riparian areas.	Surface water - least impact to surface water quality and quantity from surface-disturbing activities and from livestock grazing. ORV use - least impact to water quality due to "limited" designation on 1,600,054 acres and "closed" on 32,946 acres.	Surface water - impacts from surface-disturbing activities similar to Existing Mgmt.	Surface water - same as Alternative C. ORV use - same as Alternative C.
Oil and Gas - Impacts to water resources would be significant. Up to 115,688 tons of sediment may be lost from the Overthrust region and 294,444 tons from the Green River region. Increased salinity of surface water. Increased risk of groundwater contamination due to water injection and secondary recovery. Reduced long-term erosion due to reclamation.	Decrease in impacts from sedimentation due to implementing AMPs. Short-term increases in sediment due to vegetation manipulation but decrease in the long term.	ORV use - same as Existing Management.			
Impacts to water through high bacteria counts, sedimentation, and soil compaction by livestock. Lower water tables due to overgrazing in riparian areas.	ORV use - Same as Existing Management, except that soil loss in Raymond Mountain area would increase after removal of WSA status.				
Increased impacts from surface runoff and channelization due to "open" ORV use leading to increased sedimentation. Reduced impacts to water quality in Raymond Mountain WSA due to interim management for wilderness.					

TABLE S-2

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
LIVESTOCK MANAGEMENT AND VEGETATION					
162,000 AUMs for livestock.	Same as Existing Management except: 162,000 AUMs for livestock plus some portion of 31,901 additional AUMs.	Same as Existing Management except: 162,000 AUMs for livestock plus 46,414 additional AUMs.	Same as Existing Management except: 123,820 AUMs for livestock. No additional AUMs.	Same as Existing Management except: AUMs for livestock limited to State and private AUMs.	Same as Alternative A except: 162,000 AUMs for livestock plus some portion of 31,901 additional AUMs.
Oil and gas - 6,565 acres of direct disturbance and 12,172 acres of indirect disturbance.	Geophysical and oil risk to grazing and lambing increased. Acres of surface disturbance may be increased.	No risks to lambing from geophysical and oil and gas actions. Forage for livestock improved on reclaimed sites.	Least long-term impacts from surface-disturbing activities. Impacts to riparian areas from placer mining or gravel sales minimal.	Vegetation benefits: increased seed production, litter accumulation and vegetation production; stable or improved range condition; 51,085 acres of denuded range would have stable trend.	Long-term improvement in vegetation condition on reclaimed sites.
Some lambing loss. Hazard to livestock due to unfenced mudpits. Reduced vegetation 5 to 8 years until reclamation occurs; halogeton invasions if not successful.	Site reclamation less beneficial than Existing Management.	39 AMPs: grazing systems; greatly improved distribution; significant increase in production and availability of forage; restored productivity on denuded sites with potential.	Livestock water quality would improve. Vegetation condition of reclaimed areas would improve significantly.	Long-term productivity of Federal AUMs would be significantly reduced.	23 AMPs. "I" allotments: stable or improving range condition. "W/C" allotments: short-term increase in labor and funds needed from permittee; long-term increased productivity; some adverse impact to permittees from delay or denial of conversions (sheep to cattle). 646 AUMs added from land newly authorized for grazing.
5 AMPs: improved livestock distribution; increased forage production.	23 AMPs: increased forage quality and quantity; improved distribution; more efficient forage use; increased flexibility for permittees; static or improving range condition; riparian forage improved.	Improved distribution; significant increase in production and availability of forage; restored productivity on denuded sites with potential.	23 AMPs: vegetation condition would improve or stabilize. Least flexibility; no conversions; more herding and fencing; shortened seasons. Some economic hardship to permittees.	No forage improvement from vegetation manipulation.	Reduced conflicts from ORV use.
Long-term improvement in forage condition on 5,000 acres subject to vegetation manipulation.	"W/C" allotments: static or improving range condition.	646 AUMs added from land newly authorized for grazing.	Fewer conflicts with ORVs.		
Land disposal in Star Valley may result in 604 AUM loss.	Long-term improvement in forage condition on 82,610 acres subject to vegetation manipulation.	Long-term improvement in forage condition on 136,960 acres subject to vegetation manipulation.	Long-term improvement in forage condition on 33,500 acres subject to vegetation manipulation.		Long-term improvement in forage condition on 82,610 acres subject to vegetation manipulation.
Raymond Mountain Road closures reduce disturbance to livestock.					

TABLE S-2

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
FISH AND WILDLIFE HABITAT					
Current stipulations are generally effective in minimizing adverse impacts of exploration in crucial wildlife habitat.	Same as Existing Management except: Alternative most likely to reduce big game numbers.	Same as Existing Management except: Riparian reclamation would encourage overuse by livestock, adversely impacting fisheries habitat. Additional reclamation requirements would be more beneficial to wildlife.	Same as Existing Management except: Beneficial impacts to big game from: reclamation; offsite oil/gas mitigation; closing Rock Creek and Slate Creek winter ranges to snowmobiles; land retention in winter ranges; oil/gas lease withdrawals in most crucial portions of elk and mule deer winter ranges; closure of Slide Rock Trail (elk calving and crucial winter range); "limited" ORV designation; and more restrictive right-of-way stipulations.	Same as Existing Management except: Impacts from livestock grazing would be reduced. Riparian areas would improve in condition. Increased carrying capacity on big game winter range.	Long-term productivity of wildlife would be maintained or improved. Impacts to big game wintering areas.
Aquatic habitat could be adversely affected by excess sedimentation and contamination from spills (Infrequent). Reclamation is generally beneficial.	Greatest reduction in fisheries productivity. Riparian areas would be damaged by unrestricted vehicle crossings.	Emphasized livestock production would adversely impact big game range and riparian habitat.	Oil/gas lease withdrawals in most crucial portions of elk and mule deer winter ranges; closure of Slide Rock Trail (elk calving and crucial winter range); "limited" ORV designation; and more restrictive right-of-way stipulations.	Without additional livestock, water developments benefit would be less than under Alternative C.	Elk calving areas and sage grouse strutting grounds from geophysical exploration would be the same as Alternative C.
Livestock grazing would cause declining riparian conditions; may reduce populations of Bonneville cutthroat trout.	Alternative most likely to adversely affect raptor nesting areas and sage grouse strutting grounds.	Vegetation treatments could reduce mule deer and antelope crucial winter forage. Fisheries habitat would be degraded which could cause Bonneville cutthroat trout to become listed as threatened or endangered species.	Oil/gas lease withdrawal for bald eagle roosting areas. Sage grouse lek sites would be maintained or improved.	Long-term increased productivity for wildlife may significantly increase wildlife numbers.	Impacts from oil/gas development would be less than under Existing Management but greater than under Alternative C.
1 ACEC and 2 HMPs would benefit wildlife habitat.	82 reservoirs would improve waterfowl habitat and extend sage grouse and big game ranges.	Right-of-way management would be similar to Alternative A, except that improved reclamation would benefit wildlife.	Adverse impacts from livestock grazing to big game and riparian areas would be less than any alternative except Alternative D.	Impacts to riparian areas would be minimized.	Impacts from oil/gas development would be less than under Existing Management but greater than under Alternative C.
Unrestricted ORV access would reduce security cover to big game.	Riparian areas would improve where distribution is improved (23 AMPs).	Reduced right-of-way stipulations would increase impact to wildlife; in crucial habitats, these may be significant.	4 HMPs would benefit wildlife habitat.	Impacts from livestock grazing would be similar to Alternative A except that riparian areas would be managed to avoid adverse impacts.	Impacts from ORV use, land disposal, and right-of-way management would be similar to Alternative C.
Fire may benefit big game habitat except in cover areas; sage grouse and sparrows are adversely affected by large fires.	Land sales to facilitate energy development would adversely impact wildlife habitat.				

TABLE S-2

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
LAND RESOURCES					
Disposal of 3,700 acres in Star Valley and 38,000 in the remainder of the KRA; removal of lands from multiple use management. Transfer of lands to other agencies is costly. R&PP provide positive economic impacts. Mitigations on rights-of-way cause delays. Management difficulties caused by granting separate rights-of-way for communication sites. Lack of an access acquisition plan would result in delays.	Similar to Existing Management. Amount of acres disposed of would be less, due to preference to oil and gas lessees. Negative impacts to county revenue. Additional costs and delays due to rights-of-way mitigations would be reduced. Reduced difficulties in granting rights-of-way for communication sites. Beneficial impacts from access acquisition plan.	Exchange of lands in the checkerboard would improve management. Increased costs and delays on rights-of-way due to additional mitigations. Rights-of-way for communication sites - Same as Existing Management. Access acquisition plan - Same as Alternative A.	Further negative impacts to maintaining acreages that are difficult to manage. Increased expenditures of funds. Negative impacts to county revenues. R&PP reduce adverse impacts. Increased time delays and costs. Some increased acreages disturbed due to avoidance of re-sources and lengthening rights-of-way. Rights-of-way for communication sites - Same as Alternative A. Access acquisition plan - Same as Alternative A.	Same as Alternative C. 2,500 acres would have patent restrictions. Impacts from transferring 74,000 acres. Delays and costs from right-of-way management is the same as Existing Management. Rights-of-way for communication sites - Same as Existing Management. Access acquisition plan - Same as Existing Management.	Same as Existing Management. Impacts from seasonal stipulations and avoidance areas would be the same as Alternative C. Communication sites would be the same as Alternative A. Access acquisition plan - Same as Alternative A.

TABLE S-2

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
CULTURAL RESOURCES					
Historic Trails Plan and Cultural Resource Management Plan would help to protect historic trails and cultural resources.	Same as Existing Management except: Increased risk of destruction or damage to prehistoric and historic sites and trails from geophysical exploration and from oil and gas development.	Same as Existing Management except: Impacts to cultural resources, especially historic trails, would be reduced. Acceleration of range improvements would require additional Class III inventory. Increased livestock would have greater adverse impact to cultural resources in riparian areas.	Same as Existing Management except: Protection of wildlife habitat would benefit any cultural resources in the same area. Increased buffer around historic trails would provide protection. Improved vegetative cover would aid in archeological site preservation, although Class III inventory would become more difficult.	Same as Existing Management except: Reduced livestock grazing would provide minimal beneficial effect to cultural resources.	Same as Existing Management except: Closure of wet roads would benefit historic trail system. Lesser degree of adverse impact to trails.
Onshore oil/gas Order No. 1 may result in additional unmitigated impacts by restricting where Class III inventories are performed. Geophysical exploration may damage fragile cultural values, especially off established roads or under muddy conditions, and near water and semi-stabilized sand dunes.					Sites near perennial streams would be beneficially impacted. Less visitor use of Dempsey Ridge would have beneficial impact.
Livestock grazing and prescribed burning make cultural resources easier to locate. Grazing on muddy areas may cause disturbance which adversely affects cultural resources.			Reduced visitor access to Raymond Mountain ACEC would reduce vandalism and illegal artifact collection. Other road closures would protect historic trail segments.		Unavoidable damage or loss of cultural resources would be similar to Alternative C.
ORV use and new roads may adversely impact cultural resources.			This alternative would result in the least degree of irreversible, irrevocable commitment of cultural resources.		

TABLE S-2

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
FORESTRY					
Little affect due to sale of timbered lands in Star Valley. No affect to regional timber production.	Reduced costs for forestry operations. Yield - No affect.	Similar to Existing Management. Beneficial impacts from reclamation.	Increased costs to forestry operations due to mitigation. No affect on forest production. Lands due for sale under Existing Management would be retained.	Reduction in timber base due to transfer of timbered lands.	Similar to Existing Management

TABLE S-2

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
RECREATION					
Geophysical - No adverse impacts to hunting.	Geophysical - Some adverse impacts to hunting resulting in a slight decrease in hunting expenditures.	Same as Existing Management except: An increased number of AUMs may increase conflicts between livestock operators and ORVs.	Same as Existing Management except: Geophysical - limited impacts to hunting; slight increase in hunting expenditures.	Same as Existing Management except: Conflicts between ORVs and livestock operators are greatly reduced.	Same as Alternative C.
Oil and Gas - Limited impacts to hunting. Adverse impacts in areas of high recreation potential.	Oil and Gas - Increased access to sites with recreation potential.		Oil and Gas - Reduced impacts to hunting.	Same as Alternative C.	
Significant increases in oil and gas development could significantly impact hunting.	Greater degree of impacts to recreation resources.		Lesser impacts than Existing Management.	Fewer RAMPs would provide less protection to recreation resources.	
Adverse impacts to recreation resources.			Recreation potential and visual resources would be maintained to a greater degree.		
ORV use would continue at the same rate. Conflict between ORV users and livestock operators.	ORV - Similar to Existing Management.		ORV - KRA designated "limited" for ORVs.	If transfer of lands to the Wasatch National Forest occurs, the forest would manage the recreation potential.	
Raymond Mountain WSA and ACEC - limited impacts. After WSA status is removed, wilderness values may be adversely impacted.	Raymond Mountain WSA and ACEC - Loss of primitive values due to oil and gas development.		Reduced conflicts between ORVs and livestock operators.		
Some loss of high recreation potential areas may occur due to development.	Greatest degree of impacts to primitive values and solitude in the WSA.		Decrease ORV opportunity.		
No significant impacts to Oregon and Mormon Trails, Corum and Hill graves, Emigrant Springs, and Raymond Mountain ACEC.			ACEC values would not be impacted.		
			Raymond Mountain WSA values would be preserved.		
			Three RAMPs would help preserve or develop recreation potential.		

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CHAPTER I

PURPOSE OF AND NEED FOR ACTION

INTRODUCTION

The Kemmerer Resource Management Plan (RMP) is being prepared to provide a comprehensive framework for allocating and managing public lands and resources in the Kemmerer Resource Area (KRA) in compliance with the Federal Land Policy and Management Act of 1976 (FLPMA). This document includes both a preferred alternative and a draft environmental impact statement (EIS). The RMP and EIS do not describe or analyze all "specific" actions that will take place in the KRA (Map 1). Some actions will follow approval of the RMP. They will be in conformance with the provisions of the RMP and will not be implemented without complying with appropriate environmental analysis and documentation requirements.

This document analyzes alternatives for livestock grazing on the public lands within the KRA. It is intended to meet the requirements of a court-ordered agreement stemming from a 1973 lawsuit filed by the Natural Resources Defense Council. The RMP will also be used to consolidate and update management direction currently contained in Management Framework Plans (MFPs). The plan will provide land use allocations and management practices for important resource values.

The public was invited to participate in identifying issues and planning criteria and later in the planning process. This assures that everyone has been provided the opportunity to express their views on management of the KRA. After public review and comment on the draft EIS, a final EIS and proposed plan will be prepared.

PLANNING PROCESS OVERVIEW

The Bureau's resource management planning process consists of nine planning actions (we are now at planning action 7). It depends heavily on public participation and requires the use of a team of resource specialists working together

in an interdisciplinary manner. This group is called the interdisciplinary team. The planning actions are described in the planning regulations (43 CFR 1600). They are summarized below and are graphically shown in Figure 1-1.

PLANNING ACTIONS

Identification of Issues Public participation is used to help identify resource management problems and conflicts that can be resolved through the resource management planning process.

Development of Planning Criteria Guidance is developed to help focus the rest of the planning process. A major component of this guidance is the development of constraints on the development of alternatives.

Inventory Data and Information Collection Data and information needed to develop alternatives and to complete the environmental analysis are collected.

Analysis of the Management Situation The existing situation in the resource area is examined. Current management guidance is compiled and an analysis of existing problems and opportunities is completed.

Formulation of Alternatives Several complete, reasonable resource management alternatives are developed. They include one for No Action and several that resolve the issues while placing emphasis on different ways of resolving them.

Estimation of Effects of Alternatives The physical, biological, social, and economic effects of implementing each alternative are estimated to allow for a comparative evaluation of impacts.

Selection of the Preferred Alternative Based on information gathered and analyzed earlier, a preferred alternative is selected. The draft EIS is then printed, filed, and distributed for public review.

Selection of the Resource Management Plan After public comments are reviewed and appropriate changes made to the analysis, the proposed resource management plan is selected. This is published together with the final EIS. After

PURPOSE OF AND NEED FOR ACTION

a 30-day period in which protests can be filed and a 60-day period for the Governor's consistency review, the plan can be approved.

Monitoring and Evaluation Monitoring, as described in the plan is conducted. In some cases this involves the collection and analysis of long-term condition and trend data to determine the effectiveness of the plan in resolving the identified issues. Over time, monitoring can show where adjustments are needed.

PLANNING ISSUES

At the early stages of the planning process the public was provided the opportunity to identify their concerns and unresolved questions about resource use and management in the KRA. These concerns were evaluated and grouped into broader topics. The greater the number of individuals, groups, or agencies sharing a similar concern the greater the possibility the concern was identified as a planning issue. Similarly, when the impacts are likely to be significant, there will usually be a planning issue associated with them. The planning issues were approved on January 23, 1984.

While the alternatives were being developed, it became clear that some of the concerns under certain approved issues could be more appropriately considered under other issues. The team redescribed some of the issues to correct this problem but did not omit any of the concerns identified in the issues approved on January 23, 1984. An example of this redescription is the issue dealing with wildlife habitat management. Many of the concerns associated with adverse impacts to wildlife habitat are associated with other issues (e.g. Issues 1, 2, and 4). The wildlife habitat issue (Issue 5) has been redescribed focusing primarily on upland wildlife habitat and riparian concerns.

We have attempted to reduce the number of instances when the same management action is listed under several issues. If the reader is concerned about how wildlife concerns will be handled for oil and gas development proposals, both Issue 2 and Issue 5 should be reviewed.

The management of the Raymond Mountain Wilderness Study Area, if Congress does not designate it as a Wilderness Area, was added to Issue 6. The EIS prepared by the BLM in May 1984 recommends that the area not be designated as a Wilderness Area.

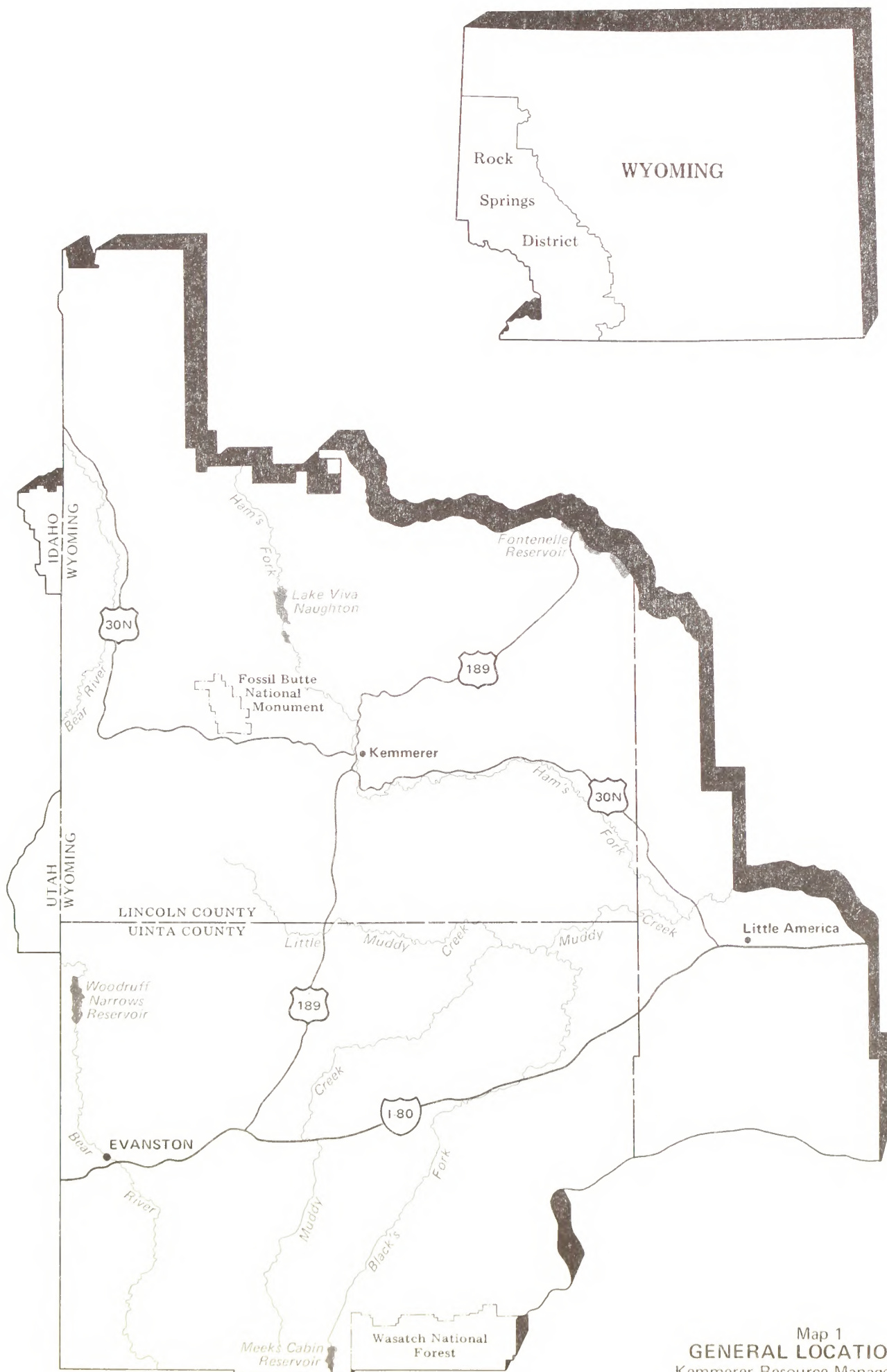
Some concerns may not be apparent in the planning issues. It is important to recognize that many concerns cannot be resolved by a resource management plan. Some may require changes in legislation, regulations, budgets, or policies at other levels.

Statement of Issues

1. There is conflict between geophysical exploration (with associated activities) and wildlife, range, and recreation.
2. There is conflict between development of oil and gas fields, including exploration drilling, and wildlife, range management, and recreation.
3. Industries that cause surface disturbing developments are committed to reclamation of disturbed lands. However, the final use or condition of reclaimed areas is sometimes different than expected.
4. Changes in range management practices may be needed to address conditions that are presently below acceptable standards in several areas throughout the KRA.
5. Wildlife habitat management adjustments may be needed to address conditions and practices which adversely impact key habitat in several areas throughout the KRA.
6. Recreation management adjustments may be needed to provide adequate ORV management and recognition of potential recreation opportunities. Management options for the Raymond Mountain WSA must be identified should Congress decide not to designate it as a Wilderness Area.
7. There is a need for land sales and transfers of public land.
8. Better management of utility and communication uses of public lands is needed.
9. There is a lack of access to public lands, especially for forestry and recreation purposes.

Explanation of Issues

1. **There is conflict between geophysical exploration (with associated activities) and wildlife, range, and recreation.**



Map 1
GENERAL LOCATION MAP
Kemmerer Resource Management Plan

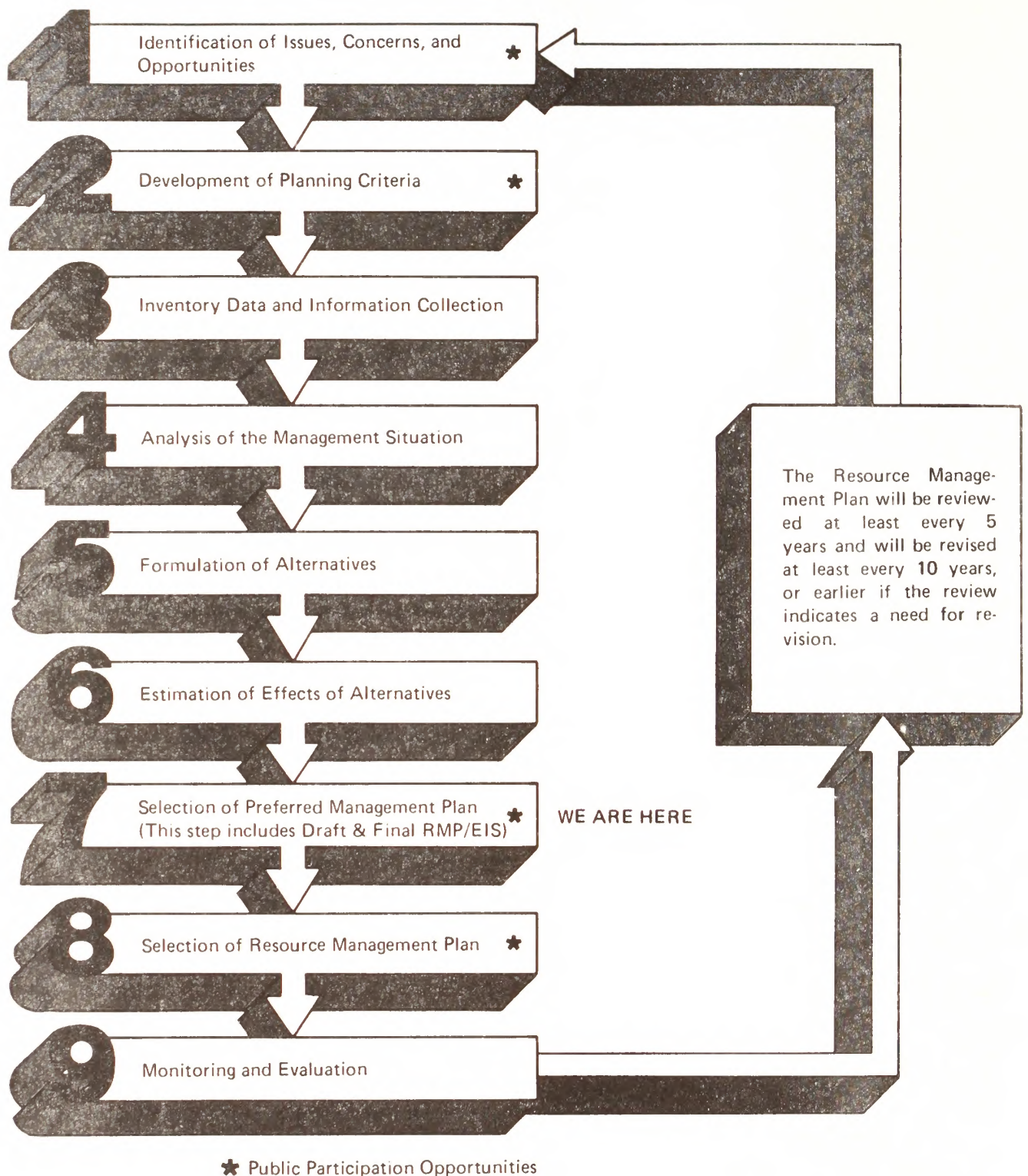


Figure 1-1
STEPS IN THE RESOURCE MANAGEMENT
PLANNING PROCESS

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Geophysical exploration impacts on hunting activities in October in the northwest quarter of the KRA. Some hunters want little or no geophysical activities, while some oil and gas companies want no hindrances to exploration.

Geophysical exploration impacts many species of wildlife. Impacts are most critical during key seasons such as wintering for big game, nesting/strutting season for sage grouse, elk calving seasons, etc. As in hunting conflict, impacts are mainly related to blasting, helicopters, and human activity. Key conflicts, in addition to the big game winter range and hunter use areas, exist in sage grouse nesting/strutting areas, bald eagle roosting areas in Rock Creek and Woodruff Narrows, and near golden eagle, ferruginous hawk, and prairie falcon nesting sites.

Geophysical exploration may interfere with livestock management. Impacts are most critical during the lambing season (spring), also in areas confined by fences, topography, or other factors. Disturbance to livestock can cause loss of livestock, loss of lambs during lambing, loss of productivity, and abandonment of newborn lambs.

2. There is conflict between development of oil and gas fields, including exploration drilling, and wildlife, range management, and recreation development.

Oil and gas wells and support facilities cause increased human activity which interferes with wildlife movement and removes areas of wildlife habitat. This occurs in all oil and gas fields, and in wildcat wells throughout the KRA. The problem is compounded because nearly all crucial winter ranges for elk and deer are already under lease. Some feel that withdrawal from leasing or "no surface occupancy" stipulations should be attached or some leases have their old stipulations brought up to newer standards. Management of crucial winter ranges requires commitments in some key areas to these kinds of restrictions, especially in the Rock Creek and Slate Creek crucial big game winter ranges.

Oil and gas companies are concerned about too many existing restrictions on development; they want all areas open for leasing and development, and need gravel for road development that occurs in conjunction with development.

Injection of fluids under pressure in some wells may be producing unknown impacts on water aquifers and even some surface waters.

The development of deep gas wells in the KRA often produces "sour gas" containing poisonous hydrogen sulfide (H₂S) which can be fatal to human life at dosages as low as 250 parts per million (ppm). Impacts of individual well field developments have been analyzed in environmental documents, but the cumulative impacts of sour gas wells, pipelines, and plant sites have not been completely assessed for potential danger to human life, livestock, and wildlife. The Riley Ridge development near Big Piney and LaBarge, with facilities at Shute Creek in the KRA may pose potential problems and was analyzed in the Riley Ridge Natural Gas Project EIS. Air quality is monitored and managed by the State of Wyoming, so coordinated BLM-State air quality modeling and cumulative assessment is needed to estimate impacts and cost benefits. The Forest Service is involved in this issue because several upwind sources may affect Forest Service wilderness areas (there are also dangers of downwind acid rain, etc.). The public also may avoid recreation or hunting areas they perceive as potentially dangerous.

3. Industries that cause surface disturbing development are committed to reclamation of disturbed lands. However, the final use or condition of reclaimed areas is sometimes different than expected.

Reclamation practices should be designed to achieve soil stability and ground cover first, then to provide vegetation compatible with subsequent land use planning and reduce visual impacts. There is a need to consider reclamation standards that promote wildlife management objectives, especially in the important wildlife habitat winter ranges, and aspen/riparian habitats. Oil and gas companies feel that many restrictions for wildlife habitat are already too strict, that reclamation with inflexible species composition in seed mixtures is unrealistic, and that proposed "extras", such as fencing or offsite mitigation is asking too much. Reclamation problems occur largely in the southern and eastern portion of the KRA where precipitation is lowest. Steep topography in other parts of the KRA (e.g., northwest quarter) cause additional reclamation problems. There may be a need for varying seed mixes to accomplish objectives for such differing areas as Granger-Moxa Arch,

PURPOSE OF AND NEED FOR ACTION

Bridger Valley, Evanston area, Shute Creek (soil and water availability differences require varied treatment).

Reclamation is generally less than five years old, and so far revegetation often has failed to provide vegetation for livestock forage needs. In many instances halogeton and noxious weeds invade disturbed areas and make them unacceptable for grazing. The halogeton problem is especially bad in the Granger area where native soil and precipitation preclude successful revegetation of native species.

4. Range Management - estimated range condition is presently below acceptable standards in several areas throughout the KRA; areas with problems will be identified as "Improve" (I) allotments accounting for about 50 percent of the KRA; other areas not identified as needing, or adequately responsive to, possible improvements are "Maintain" (M) or "Custodial" (C).

Most range condition problems that can be dealt with effectively are within the proposed "I" allotments. They were selected for "improved" management because of range condition, production potential, conflicts with other resources or resource management, potential benefits from making improvements, and other problems in range management.

Grazing management for allotments currently placed in "M" and "C" categories would be analyzed to meet the requirements of the court settlement for the NRDC suit on grazing.

5. Fish and Wildlife Habitat

Wildlife habitat management is often interdependent on mineral activities, range management, recreation management, and other activities. Conflicts associated with these activities also present opportunities and challenges to manage wildlife habitat and establish standards for monitoring and managing habitat condition. Workable limitations on development activities, habitat manipulation, especially as part of offsite mitigation, and further cooperative efforts with the Wyoming Game and Fish Department are needed to establish an effective wildlife habitat management program. Key problems or conflicts are discussed under

Issues 1, 2, 3, and 4. Priorities by area for habitat management should be identified even where conflicts are not involved. Riparian habitat is a key natural resource valuable to wildlife, livestock, water quality, recreation, and other interests. Management of riparian areas is one of the key wildlife habitat management issues. Effective and practical stipulations on development and livestock use of riparian areas is a high priority, and new methods of managing need to be considered for these areas. Management actions for livestock management and other programs (e.g. minerals) should be directed at reducing sedimentation and salinity. Many development activities result in adverse impacts to watershed values. Management practices to mitigate such adverse impacts should be developed. Of special concern are measures which could result in a reduction of salinity to the Colorado River system.

6. Recreation Management - Recreation Opportunities and ORV Management

Recreation potential is being identified and managed to assure that high potential areas for campsites, picnic sites, horse corrals, trails, visitor facilities (toilets, etc.), and other opportunities are preserved. Increasing developments may unknowingly eliminate this potential if it is not preserved. There are no BLM recreational developments and none anticipated in the short-term, but preservation of the potential for development is a major recreation issue. The preservation of the recreation experience in the upper Hams Fork and Raymond Mountain areas are of prime importance. Also of importance are the entire Dempsey Ridge, Commissary Ridge, Pine Creek, and Meeks Cabin areas. Opportunities exist to assure that road networks facilitate development in a planned manner and that key areas are preserved from adverse impacts of development.

Off-road vehicle management (ORV) relates to making ORV management prescriptions compatible with the U.S. Forest Service on adjoining parcels of land. They have some "limited" areas along the northern border of the Wasatch National Forest and would like BLM to investigate the feasibility of matching border lands management.

Management for the Raymond Mountain WSA should be identified if Congress decides not to designate it as a Wilderness Area.

PURPOSE OF AND NEED FOR ACTION

7. Land Sales and Transfers of Public Land

The Federal Land Policy Management Act (FLPMA), Section 203, establishes reasons and standards for the sale of public lands. Lands that appear to meet these disposal criteria will be identified in the RMP. Lands identified for disposition under the previous management plan in accordance with the FLPMA include all of Star Valley and isolated parcels elsewhere in the KRA. Isolated and unmanageable lands need to be identified and either sold or transferred, especially in the Bridger Valley, Meeks Cabin, and Utah-Wyoming border areas.

The Wasatch National Forest has requested that BLM consider a land transfer of all public land surrounding the Forest. These are largely isolated parcels except for the solid block lands immediately around the Forest.

8. Better management of Utility and Communication Uses of Public Lands

Utility corridors and windows need to be designated (beyond present corridor plan) to avoid resource conflicts and needless disturbance. The impacts of utility rights-of-way have traditionally been minimized through the use of corridors (e.g., the use of windows and "no utility" areas, or avoidance areas need to be considered). Comprehensive planning for communication sites is needed to avoid conflict between communication site users. Establishment of orderly development, and establishment of maximum user and building numbers is needed.

9. Lack of legal and physical access to public lands, especially for forestry, range, and recreation purposes and need for a designated transportation system that minimizes impacts to natural resources

Acquire access to the Meeks Cabin area for forestry and recreation purpose or alternative solutions for selling forest products. Numerous isolated parcels in Bridger Valley, Cokeville, and Utah-Wyoming border either may have some type of management projects which require access or the parcel should be considered for disposition if the benefits of access do not justify expenditures.

Associated road development needs more effective management to minimize impacts to wildlife habitat, especially crucial winter ranges. Some existing roads evolved rather than being planned; this process must stop. Many do not have appropriate design, grade, etc.

Consideration should be given to road management approaches such as reducing road density, placement of roads, seasons of use restrictions.

PLANNING CRITERIA

Planning criteria establish guidelines for proceeding with the planning process. A major function is to provide constraints for the development of reasonable alternatives. Proposed planning criteria were made available to the public before they were approved by the District Manager. The planning issues and planning criteria were approved on January 23, 1984.

Planning criteria for the Kemmerer RMP are listed below. First, general planning criteria are listed, then planning criteria which guide the development of alternatives for certain issue-related programs.

General

1. Alternative selected should not overly or unnecessarily restrict public use of public land.
2. Alternative selected should be sensitive to local concerns.
3. Alternative selected should protect fragile and unique resources.
4. Alternative selected should promote or at least not hinder, stability and diversity in the local and regional economy.
5. Alternative selected should be responsive to resource issues and national concerns.
6. All alternatives should be feasible to implement.
7. All alternatives will seek solutions to the issues identified within the mandates of FLPMA, such as multiple-use and sustained yield principles.
8. All alternatives will contain management prescriptions consistent with the Bridger-Teton National Forest, Wasatch National Forest, State, and local land use plan; inconsistencies will be explained.
9. All alternatives will include those prescriptions described in "Management Actions Common to all Alternatives," such as utility corridors, trona mining decisions,

PURPOSE OF AND NEED FOR ACTION

coal mining decisions, wilderness decisions (non-wilderness for Raymond Mountain WSA), protection of Threatened and Endangered Species, etc.

10. All alternatives will recognize the VRM policy that visual values are an integral part of the Bureau's management in all programs.
11. All alternatives will comply with national and State laws and regulations, especially as outlined in BLM national and state director guidance.
12. All alternatives will be developed by a systematic interdisciplinary approach to integrate considerations of physical, biological, economic, social, and environmental components.
13. All alternatives will continue to allow for oil and gas leasing; the level of activity and stipulations would vary by alternative.
14. All alternatives will provide for maintaining wetland, riparian, and flood plain areas (administered by BLM) in current condition or better.
15. All alternatives will include land disposition needs (sales, exchanges, municipal purpose grants, etc.); the emphasis on sales may vary slightly between alternatives.
16. All alternatives will provide planning guidance to the area for approximately 20 years and implementation of decisions will begin approximately when the BLM Record of Decision is available to the public.
17. All alternatives will use existing data.

Oil and Gas

1. All alternatives will continue to allow for oil and gas exploration, leasing, and development in accordance with the high priority and policy established for developing American energy sources, while protecting other resource values. The Mineral Leasing Act of 1920, as amended, and Mineral Leasing for Acquired Lands Act of 1947 (the basis for oil and gas leasing), will be complied with in all cases. The stipulations would vary by alternative.
2. All alternatives will recognize and provide some stipulations for protection of key resource values in accordance with FLPMA and other policy (recognize wildlife values, soil, sustained yield of forest products, etc.). The level of stipulations and constraints will

vary with several alternatives in accordance with objectives for that alternative.

3. All alternatives will include recognition of the need for sand and gravel as support for oil and gas development and, to the extent possible, will provide for expeditious development of Federal sources.
4. At least one alternative will minimize as much as possible the constraints on oil and gas exploration and development.

Wildlife Habitat Management

1. At least one alternative will provide sufficient wildlife habitat to support Wyoming Game and Fish wildlife numbers in their Strategic Plan.
2. At least one alternative will consider identifying key areas that are unsuitable for surface disturbance to provide some innovation in management of these areas (e.g., new stipulations, NSO consideration, threshold levels, etc.).
3. All alternatives will include continued coordination with Wyoming Game and Fish Department and other agencies (e.g., Fish and Wildlife Service) for the purpose of developing effective management practices, including water development in conjunction with range and mineral activities, habitat development, and habitat protection.
4. All alternatives will recognize the importance of other programs yet still identify opportunities to enhance and promote wildlife habitat through such affirmative programs as habitat manipulation. Workable limitations on development activities will be identified for each alternative. This means that key wildlife habitat areas (crucial big game habitat, calving and fawning areas, T&E habitat, sage grouse strutting grounds, riparian habitat) and the priorities for their management will be identified in each alternative. Also, appropriate management practices for these priority areas will be identified.

Range Management

1. The alternatives addressed in this RMP will provide a range of uses for livestock grazing from the minimum where allowed use is based only on private land capacity, to the maximum

PURPOSE OF AND NEED FOR ACTION

where as many economically feasible improvements as possible would be developed to maximize available livestock forage within the planning timeframe.

2. All alternatives except the No Grazing alternative, will include provisions and improvements that have been developed through rancher consultation.
3. All alternatives, except the No-Grazing Alternative (Alternative D), will implement the BLM Rangeland Management Policy to categorize allotments by their needs for improvement in range condition and the potential effectiveness of improvements.
4. The No-Action or Existing Management Alternative, which constitutes the current management direction, will be considered the initial proposed action for livestock grazing in all allotments. It portrays the future land management with no change in present range use levels or systems, meaning livestock grazing shall be based on the permittees' or lessees' active preference, previous year's licensed use, or average actual use (IM 82-650). The BLM's preferred alternative, which is based on rangeland monitoring and consultation with permittees, may differ from this initial proposed action.
5. All alternatives will include allotment specific management objectives.

Recreation Management

1. All alternatives will anticipate continued low levels of funding for recreation management. Alternatives with higher levels of use will make the maximum use of seasonal employees, volunteers, and other-than-Federal development money.
2. All alternatives will contain an ORV management element, carrying forward the existing ORV Management Plan. However, levels of management may vary among alternatives, the least restrictive management providing the highest amount of "open" area for ORV use. The most restrictive management would contain the most "limited" and "closed" designations.
3. All alternatives will contain visual, ORV, and recreation elements consistent with plans for adjoining Forest Service lands to assure consistency in planning and avoidance of public conflicts (e.g., an ORV

closure on the Forest should not match up to an ORV open area on public lands such that the closure is nullified).

4. All alternatives will consider methods of utilizing minerals and timber management roads to facilitate use of recreation resources; however, alternatives will establish guidance on areas of high priority value which roads should avoid.
5. All alternatives will consider the needs of adjacent private landowners in any recreation, ORV, and visual management proposals.
6. At least one alternative will portray the lowest level of recreation management, emphasizing primitive and undeveloped recreation sites.

Lands Management

1. No alternative will make proposals infringing upon the rights of holders. RMP decisions affecting private lands will be avoided.
2. All alternatives will utilize the findings of the May 1980 Western Regional Corridor Study in developing corridors for utilities.
3. All alternatives will provide as much detail to corridor identification as possible to lessen the future time-consuming environmental workload of assessing impacts not previously identified.
4. All tracts of public lands meeting the Federal Land Policy and Management Act disposal criteria (section 203) will be identified and reviewed.

INTERRELATIONSHIPS WITH OTHER LAND USE PLANS

BLM Planning

The Resource Management Plan will replace the existing Kemmerer Land Use Plans, Pioneer Trails, and Star Valley in accordance with BLM's planning regulations and Manual 1601 - 1632.

Activity planning is the next step toward implementing the planning decisions upon completion of the RMP. Activity plans are site-specific analyses utilized to aid the implementation of the planning decisions.

PURPOSE OF AND NEED FOR ACTION

Adjacent BLM Areas

The Kemmerer Resource Area is bounded to the north and east by the Pinedale Resource Area, to the east and southeast by the Big Sandy and Salt Wells Resource Areas. Each of these resource areas is part of the Rock Springs District. Kemmerer also borders the Salt Lake District to the south and the west and the Idaho Falls District to the northwest.

The Big Sandy and Salt Wells Resource Areas and the adjacent portions of the Salt Lake District are administered under existing land use plans called Management Framework Plans (MFPs). The Pinedale Resource Area has initiated the preparation of an RMP and is currently in the Analysis of the Management Situation phase. The Idaho Falls District is developing issues and planning criteria, the initial phase of an RMP effort.

The Kemmerer RMP effort and these new planning efforts being initiated are coordinated in order to assure consistency in land use decisions between adjacent areas. This coordination will continue throughout the life of the applicable planning decisions.

Forest Service Planning

Four National Forests' boundaries are adjacent to various portions of the Kemmerer Resource Area. The Wasatch-Cache, Caribou, Bridger-Teton, and the Ashley all adjoin the KRA and are subject to land use planning.

The Forest Service Land and Resource Management Plans (LRMPs) are coordinated with the BLM planning system, where applicable. In particular, oil and gas development on the forest is discussed in the LRMPs although the actual oil and gas leasing is a BLM responsibility. The Kemmerer RMP, thus, does not discuss oil and gas development of forest lands. This action is considered along with the many other resource actions administered on the National Forests by the Forest Service. The BLM and FS continue to coordinate their land use decisions regarding minerals development through the activity planning phase.

The Wasatch-Cache and the Caribou National Forests have completed their proposed Land and Resource Management Plans and Draft Environmental Impact Statements. The Bridger-Teton and Ashley National Forests are currently preparing their plans which should be available for review in 1985.

CHAPTER II

ALTERNATIVES

OVERVIEW

The National Environmental Policy Act (NEPA) of 1969 and the Bureau of Land Management's land use planning regulations, under the FLPMA, require the evaluation and consideration of alternatives to proposed land use plans. Each alternative analyzed in detail in this document represents a complete and reasonable plan which would be used to guide the management of the resources in the Kemmerer Resource Area (KRA). See Table 2-1 for a summary and comparison of the alternatives.

Many of the provisions listed under each of the alternatives restrict surface disturbance or are designed to mitigate adverse impacts. Unless otherwise specified, such provisions may be waived on a case-by-case basis at the discretion of the responsible official. Such waivers may be granted if certain provisions are not needed in specific cases.

The objective in formulating alternatives is to identify resource allocations and management practices which resolve the planning issues in different ways. Alternatives were developed by a group of resource specialists working as an interdisciplinary team.

The Area Manager and team of resource specialists identified several general approaches to resolving one or more of the planning issues. Resource allocations and management direction for all resources were developed to fit with each general approach. Since management direction for one program has the potential for affecting the management for other programs, the components of each alternative were developed using an interdisciplinary approach. Planning criteria were used to guide the development of the alternatives.

Alternatives were not developed for activities not associated with the planning issues. Such activities are described under "Management Common to All Alternatives." The management direction for these activities will remain essentially the same as it is now. Future changes may be permitted on a case-by-case basis in accordance with applicable laws, regulations, and policies.

ALTERNATIVES ELIMINATED FROM DETAILED STUDY

Several alternatives were considered as a possible means of resolving specific planning issues. The alternatives listed below were eliminated from detailed study. They are described, together with the reasons why they were eliminated.

1. No Oil and Gas Leasing The alternative of not issuing new oil and gas leases was suggested as a means to resolve the issues associated with oil and gas exploration and development. Since virtually the entire KRA is currently under lease, it would be a long time before this alternative would help resolve the issues. The alternative was determined to be "not reasonable" for the following reasons: (1) most of the KRA is currently under lease; (2) the KRA should attempt to respond to the need for oil and gas resources; and (3) oil and gas exploration and development could take place in a manner that would avoid unacceptable adverse impacts to the KRA's other resources.

2. Areas of "No Surface Occupancy" Restrictions in the Most Crucial Parts of Big Game Winter Range A "no surface occupancy" (NSO) stipulation was considered for the most crucial big game winter ranges (Map B); however, it was not developed because most oil and gas leases in the KRA are smaller than the winter ranges. A "NSO" stipulation would result in not being able to develop the lease, which would effectively withdraw the area from leasing.

In some of the other areas there is a large percentage of private land. Restricting surface occupancy would not ensure protection of the habitat, especially if "effective habitat" losses from developments on private land are considered. These are habitat losses which go beyond the area actually occupied or disturbed.

3. No Livestock on Public Lands An alternative which would provide that no livestock would be allowed on public lands was identified and eliminated from detailed analysis. It was dropped because it was felt to be unreasonable. In order to keep all livestock off the public lands, these lands would have to be fenced. This would not

TABLE 2-1

COMPARISON OF MANAGEMENT PROPOSALS BY ALTERNATIVE

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>GEOPHYSICAL EXPLORATION (Issue 1)</u>					
<u>Big Game Winter Range</u>					
No geophysical lines 10/15 - 5/15, except on case-by-case basis.	No restrictions	Same as Existing Management	Close most critical parts of winter range 12/1 - 5/15, without exception. Rest of winter range areas same as Existing Management.	Same as Existing Management	Same as Alternative C
<u>Bald Eagle Roosting</u>					
Allow lines on a case-by-case basis 10/15 - 5/15.	Same as Existing Management	Same as Existing Management	Close a 1 mile buffer around roosting areas 11/1 - 4/30.	Same as Existing Management	Close 1 mile buffer zone around roosting areas 12/1 - 4/1.
<u>Raptor Nests</u>					
Seismic lines routed around nests as much as possible.	No buffer zones. Only stipulation would be no destruction of nest.	Same as Existing Management	No activity within 1 mile of nests during following periods: Golden Eagle 2/1 - 8/1 Prairie Falcon 3/1 - 8/1 Ferruginous Hawk 3/1 - 8/1	Same as Existing Management	No activity within 1/2 mile of nest during nesting seasons: Golden Eagle 2/15 - 6/1 Prairie Falcon 3/15 - 6/15 Ferruginous Hawk 3/15 - 6/15
<u>Elk Calving</u>					
No geophysical lines 5/15 - 6/30 except on a case-by-case basis.	No restrictions	Same as Existing Management	Elk calving areas closed from May 15 to June 30.	Same as Existing Management	Same as Existing Management
<u>Sage Grouse</u>					
From 3/1 to 6/15, no lines within 2 miles of lek center.	No restrictions	Same as Existing Management	Flexible stipulation applied only to sage grouse lek site.	Same as Existing Management	Same as Alternative C

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>Lambing</u>					
5/1 - 5/31, no geophysical lines in lambing area; 6/1 - 6/20, contact lessee.	No restrictions	Same as Existing Management	Same as Existing Management	Same as Alternative A	Close only those parts of the lambing area actually in use 5/1 - 6/20, contact lessee.
<u>Hunting</u>					
October 1 to October 31, no lines in NW quarter of KRA for deer and elk season.	No restrictions	Same as Existing Management	Close the area identified in existing management. Also, close areas on the Bear River Divide and Meeks Cabin areas to geo-physical exploration from the beginning of archery season until the end of rifle season.	Same as Existing Management	Same as Existing Management
<u>Muddy Areas</u>					
Operator notifies BLM when conditions are too muddy to work.	Same as Existing Management	BLM close parts of the resource area where muddy conditions exist to truck-mounted geo-physical lines.	Same as Alternative B	Same as Existing Management	Same as Alternative B
<u>Riparian</u>					
Reclamation of disturbed riparian habitat similar to upland sites.	Same as Existing Management	Seed mixture will include riparian-adapted livestock forage species.	Rehabilitate disturbance with species that will stabilize the soil and provide wildlife habitat.	Same as Existing Management	Rehabilitation, where necessary, will be oriented towards stabilizing soil with species dependent on management objectives.
No restrictions on distance from perennial creeks (live water).	Same as Existing Management	Same as Existing Management	No surface disturbance within 500 ft. of all perennial creeks. No surface disturbance of riparian vegetation.	Same as Existing Management	No surface disturbance within 300 ft. of perennial creeks or live water.

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
No restrictions exist on where or how to cross perennial drainages. ^{1/}	Same as Existing Management	Same as Existing Management	No perennial stream crossings except on established roads unless temporary "bridges" can be provided.	Same as Existing Management	Minimize crossings of perennial streams. Use established roads, temporary bridges, portable operations, or alternate methods.
^{1/} This proposed action applies to all equipment crossings of perennial drainages. It would be applied as described under each alternative.					
<u>Exclosures</u>					
No restrictions around range or wildlife enclosure.	Same as Existing Management	Keep lines 500 feet from exclosures.	Same as Alternative B	Same as Existing Management	Same as Alternative B
<u>T & E and Sensitive Plants^{2/}</u>					
Limit development to areas outside of delineated populations of <i>Physaria dornii</i> and <i>Physaria condensata</i> .	Same as Existing Management	Same as Existing Management	Four populations of <i>Physaria dornii</i> - maximum size of 40 acres each and 20 acres of a unique plant community with endemic cushion plants would be designated as "no surface occupancy" areas.	Same as Existing Management	Same as Alternative C

^{2/} This proposed action applies to all surface-disturbing activities. It would be applied as it appears under each alternative.

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>OIL AND GAS (Issue 2)</u>					
Leases As lease expires, stipulations are added as follows: No surface occupancy: -1,320 ft. from historic trails -500 ft. from live water Activity allowed: -5/15 to 10/15 in crucial big game winter range -6/15 to 3/1 in sage grouse strutting grounds -3/1 to 10/1 in sage grouse wintering complex -6/30 to 5/15 in elk calving areas Slopes: no restriction	Only lease stipulation required by law would be added to the lease. None of the stipulations listed under Existing Management would be used.	Same as Existing Management, with one addition: No activity allowed in lambing areas from 5/1 to 6/20. This would close lambing areas to new drilling during critical period.	Same as Existing Management except: 1) No surface occupancy: on threatened, endangered, and sensitive plant sites; within 1 mile of raptor nests during certain periods; on slopes in excess of 40%; and in wet or sub-irrigated areas. 2) Sage grouse strutting ground with flexible stipulation. 3) Eliminate sage grouse wintering stipulation. 4) Treat riparian areas as live water.	Same as Existing Management	Same as Alternative C
APDs No restrictions or development in landslide-prone areas.	Same as Existing Management	Move drill sites and road construction, if possible, out of landslide-prone areas. Limited development on 25-40% slopes. No disturbance on slopes greater than 40%.	Same as Alternative B	Same as Existing Management	Same as Alternative B
No general restrictions on access.	Same as Existing Management	Same as Existing Management	"Minimum access" areas to discourage roads in certain areas.	Same as Existing Management	Same as Alternative C

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
H ₂ S plans are site-specific for each well site.	Same as Existing Management	In new gas fields with a high H ₂ S potential, the field or unit operator would provide a dispersion analysis study for air quality. BLM would use the study to develop stipulations to protect human lives, livestock, and wildlife from hazardous effects of H ₂ S.	Same as Existing Management	Same as Existing Management	Same as Alternative B
Additional wildlife conditions are not added to the APD.	Same as Existing Management	Same as Existing Management	Add conditions to protect wildlife to APDs if they are not on the lease.	Same as Existing Management	Add conditions to protect wildlife to APDs in most important parts of crucial winter range.
Leases and APDs No construction activities allowed in important wildlife habitat on a seasonal basis.	No restrictions except those required by law for T&E species.	Same as Existing Management	Withdraw from leasing parts of crucial big game winter range and 2 bald eagle winter roosts. Offsite mitigation required (on leases & APDs) to improve habitat in all big game seasonal ranges and sage grouse nesting areas.	Same as Existing Management	Offsite mitigation required on leases and APDs to improve all habitat lost in part of crucial elk and deer winter range. NSO on bald eagle roost sites. 10% disturbance threshold for rest of big game crucial winter range and sage grouse nesting areas. Areas withdrawn from leasing under Alternative C - not withdrawn.
No surface disturbance within 1/4 mile of sage grouse lek center. Seasonal stipulation on additional 1-3/4 mile radius.	No restriction in sage grouse areas.	Same as Existing Management	Flexible stipulation applied only to sage grouse lek site.	Same as Existing Management	Same as Alternative C

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
"No surface occupancy within 500 ft. of live water" added on new leases.	No restriction	Same as Existing Management	"No surface occupancy" for a minimum of 500 ft. from live water to protect riparian vegetation and control erosion.	Same as Existing Management	Review new lease applications on a case-by-case basis and add NSO stipulation for riparian zone or 500 ft. from live water.
Reclamation requires erosion control measures on a case-by-case basis.	Limit reclamation to the minimum required to maintain riparian condition.	Reclamation should promote desirable livestock forage species.	Reclamation should control erosion and enhance riparian habitat (willows, etc.)	Same as Existing Management	Reclamation goals are: first to stabilize soil then to promote native riparian vegetation.
Offsite mitigation not required.	Same as Existing Management	Same as Existing Management	If reclamation goals cannot be met by specified time-frames, offsite mitigation would be required.	Same as Existing Management	Same as Alternative C
Well placement may be moved up to 200 ft. to avoid riparian habitat, unless prohibited by geologic constraints and State requirements.	Same as Existing Management	Apply stipulations as needed to protect livestock forage.	Use maximum movement of well sites to avoid riparian areas unless prohibited by geologic constraints and State requirements.	Same as Existing Management	Same as Alternative C

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
RECLAMATION (Issue 3)					
<u>Temporary Disturbance</u>					
<p>Roads: Topsoil is stripped and stockpiled during construction. Upon abandonment, temporary roads are reshaped to conform with topography, topsoiled, water barred, and seeded (promoting native species). The unused portions of permanent roads are topsoiled and seeded on the contour after construction. Erosion control measures (i.e. fiber matting) are used when necessary.</p>	<p>Roads: Same as Existing Management but native or non-native soil stabilizing grass species would be used in reclamation. No erosion control measures, other than water bars, would be needed.</p>	<p>Roads: Same as Existing Management but seed mixture would consist of soil stabilizing and livestock palatable species. No erosion control measures, other than water bars, would be installed.</p>	<p>Roads: Same as Existing Management except seeding operations would utilize a mixture for soil stabilization and wildlife habitat enhancement. Erosion control measures.</p>	<p>Roads: Same as Alternative A</p>	<p>Roads: Same as Existing Management except additional erosion control measures (e.g., fiber matting) may be required. Seed mixtures would be formulated site specifically and designed for soil stability, livestock use, and wildlife habitat.</p>
<p>Pipelines: Vegetation and topsoil is stripped from pipeline site and stockpiled. Upon completion of construction, routes are reshaped to conform with surrounding terrain, topsoiled, water barred, and reseeded to promote native community types.</p>	<p>Pipelines: Same as Existing Management but native and non-native soil stabilizing grass species would be used in reclamation.</p>	<p>Pipelines: Same as Existing Management except mechanical treatment would be used to remove vegetation, leaving topsoil intact. Seeding mixtures would promote soil stability and livestock palatability.</p>	<p>Pipelines: Same as Existing Management except mechanical treatment would be used to remove vegetation, leaving topsoil intact. Seed mixtures would promote soil stability and wildlife life habitat.</p>	<p>Pipelines: Same as Alternative A</p>	<p>Pipelines: Same as Alternative C except seed mixtures for reclamation would be formulated site specifically and designed for soil stability, livestock use, and wildlife habitat.</p>

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>Oil & Gas Wells</u>					
Before Construction: Review Surface Use Plan. Planned reclamation procedures would be detailed and site specific.	Before Construction: Same as Existing Management	Before Construction: Same as Existing Management except ERRP supplements pt. 10 of Surface Use plan. The ERRP would be site-specific and designed for soil stability and live- stock palatability species.	Before Construction: Same as Alternative B except ERRP would be designed for wild- life habitat and watershed enhancement.	Before Construction: Review Surface Use Plan and ERRP. ERRP would be site- specific.	Before Construction: Review Surface Use Plan and ERRP. ERRP would be site- specific.
Abandoned Wells: Location is reshaped and recontoured to conform with surrounding terrain, and then surfaced with topsoil. Seeding mixtures usually consist of 12-15 lbs. per acre of pure live seed with use of native species, where possible. Seed is drilled or broad- cast, depending on slope and/or surface rock content. Erosion control measures (fiber mat) are used where deemed necessary.	Abandoned Wells: Location treated the same as under Existing Management except: native or non-native soil-stabilizing grass species are used in reclamation.	Abandoned Wells: Location is reshaped, recontoured, and surfaced with top- soil. Topsoil would be inoculated with soil micro-organisms and fertilized, if necessary. Seeding would include species soil-promoting stability and live- stock palatability.	Abandoned Wells: Locations treated the same as Alternative B except seeding would include species promoting soil stability and wildlife habitat.	Abandoned Wells: Location would be treated like Alternative B except seeding would prioritize soil stabilization and subsequent return of vegetation density and diversity. Mixtures would be site-specific, favoring watershed, wildlife, or livestock interests.	Abandoned Wells: Location would be treated like Alternative B except seeding would prioritize soil stabilization and subsequent return of vegetation density and diversity. Mixtures would be site-specific, favoring watershed, wildlife, or livestock interests.

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>Oil & Gas Wells (cont'd)</u>					
Locations are fenced when needed, e.g., when dense populations of livestock or wildlife are present.	Fencing is not required.	Fencing would be installed on disturbance after other measures completed. Expected time frame for successful reclamation would be 4 years. In areas receiving less than 10" of precipitation, snow fences and surface depressions may be required to increase effective moisture.	In areas receiving less than 10" of precipitation, fences and surface depressions may be required to increase effective moisture.	No fencing or weed control would be required.	Fencing is not required but additional erosion control measures may be required. In areas receiving less than 10" of precipitation, snow fences and surface depressions may be required to increase effective moisture.
Producing Wells: All unused portions of disturbance are reduced to a minimum of 3:1 slopes, contoured, and topsoiled. Native and non-native (when needed) 12-15 lbs/acre pure live seed is drilled or broadcast. Erosion control measures are installed where deemed necessary.	Producing Wells: Location treated the same as Existing Management except seed consists of one soil stabilizing grass species.	Producing Wells: Location treated the same as Existing Management except seed mixtures would be designed for soil stability and live-stock palatability. Fertilization may be required to attain desired cover.	Producing Wells: Location treated same as Alternative B except seeding mixture would promote soil stability and wildlife enhancement.	Producing Wells: Location treated the same as Alternative A except erosion would be controlled only through revegetation.	Producing Wells: Location would be treated as in Alternative C except water barring and mulching would be required. Seeding operations would use soil-stabilizing species.
No offsite mitigation.	No offsite mitigation.	Offsite mitigation for loss of grazing forage may be required.	Offsite mitigation for wildlife habitat loss is required.	No offsite mitigation.	Offsite mitigation for wildlife habitat loss may be required (see Issue 5).

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
No slope restrictions (revegetation potential) on surface disturbance.	No slope restrictions (revegetation potential) on surface disturbance.	0-25%: no restriction 25%-40%: limited development contingent on site-specific proposals. 40%+: restricted	Development slope restrictions are the same as those in Alternative B.	Development slope restrictions are the same as those in Alternative B.	Development slope restrictions are the same as those in Alternative B.
No reclamation time frames invoked.	No reclamation time frames invoked.	Reclamation expected within 4 years.	Time frames same as Alternative B.	No reclamation time frames invoked.	Satisfactory reclamation including site stabilization is expected within 4 years.
<u>LIVESTOCK MANAGEMENT (Issue 4)</u>					
<u>Grazing Preference</u>					
Would continue to license the same number of AUMs as currently authorized. Approximately 162,000 AUMs.	There would be an increase* of approximately 31,901 AUMs over the long term through management actions taken by BLM on "I" allotments.	There would be an increase* of approximately 46,414 AUMs over the long term through management actions taken by BLM on "I" allotments and the prevention of decline in other allotments.	Licensed grazing would continue at current levels. This is approximately 123,820 AUMs. Management would be undertaken to protect or improve cover and available forage for wildlife and for watershed resources and to prevent overgrazing.	No Federal AUMs would be licensed* for live-stock grazing. Exchange of use agreements will be authorized for intermingled ownership pattern lands. Live-stock AUMs would be reduced to approximately 121,982 AUMs on private and State lands.	Same as Alternative A

Allotment Management Plans

No new AMPs would be developed. AMPs would continue to be followed on the Bench, Willow Creek, Poison Creek, and Beaver Creek Allotments. Rock Creek AMP would be fully implemented within ten years.	New AMPs would be developed on 18 "I" allotments over 30 years. Existing AMPs would be followed on Willow Creek, Bench, Poison Creek, Beaver Creek, and Rock Creek until monitoring and evaluation indicate the need for change.	New AMPs would be developed on 34 allotments. Existing AMPs would be handled as in Alternative A.	New AMPs would be developed on 18 "I" allotments. These AMPs would be designed to enhance wildlife habitat and watershed conditions. Existing AMPs would be handled as in Alternative A.	No new AMPs would be developed on any allotments. All existing AMPs would be cancelled.	Same as Alternative A
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* Any adjustments in grazing preference will be based on monitoring and evaluation.

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>Range Improvements</u>					
No new range improvements would be authorized on public lands except for those needed to complete the implementation of the Rock Creek AMP. Reconstruction and maintenance of necessary projects would be carried out. Maintenance to existing projects would be done as needed.	New range improvements would be authorized on "I" allotments and all "M" and "C" allotments. Maintenance would be assigned to the benefitting user.	New range improvements would be authorized to improve conditions to benefit livestock grazing. BLM would allow range improvements on all other allotments in order of priority (IMC) and maintenance of improvements where necessary.	New range improvements would be constructed to benefit wildlife as well as watershed. No livestock watering developments would be constructed in areas of crucial winter ranges for wildlife. Maintenance and reconstruction would be assigned to the benefitting user.	No new range improvements would be built on public land. Maintenance would be assigned to existing users. Approximately 300 miles of fence would be required to prevent unauthorized livestock use of areas specified for no grazing by livestock.	New range improvements would be authorized on "I" category allotments. "M" and "C" allotments would qualify as funding allows. Maintenance would be assigned to the benefitting user.
<u>Forage Increase</u>					
Forage increases are now allocated to those resources which are represented by the highest level of priority.	Forage increase (31,901 AUMs) would be balanced among all resources to achieve management objectives.	Any forage increases due to management actions would go to livestock grazing and to restore suspended preference. Any increase over and above this amount would go proportionately to other resource uses.	All forage increases would go first to satisfy the Wyoming Game and Fish Department's strategic plan for wildlife numbers, and to watershed/soils. No forage increases for livestock are proposed.	No increases would occur.	Same as Alternative A
<u>Combining Allotments</u>					
No allotments will be combined or split under this alternative.	Cottonwood Bench/Lyman Cattle allotments, and Boyd Hollow/Christy Canyon allotments would be combined.	Same as Alternative A with the Cumberland Allotment being restructured into smaller units.	Same as Alternative A	No allotments will be combined.	Same as Alternative A

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>Rangeland Monitoring and Evaluation</u>					
Data on trend, climate, utilization, and actual use are currently collected on 10 allotments. Trend data are collected on 4 other allotments. Ecological range site data condition mapping would be collected on selected "I" category allotments and some solid blocked lands.	Climate, trend, actual use, and utilization would be collected on all "I" allotments (high intensity). Actual use, climate, and some utilization and trend data will be collected on "M" allotments (moderate intensity). "C" allotments would be monitored only for climate and actual use. Ecological range site condition mapping would continue in the following order: High priority "I" allotments; remaining "I" allotments; solid block lands; checker-board lands.	All "I" and high priority "M" allotments would be monitored for trend, utilization, climate, and actual use. Remaining "M" and "C" allotments would be monitored as priorities warrant. Ecological site condition mapping would occur as in Alternative A.	Monitoring would be sufficient intensity to detect grazing use in excess of objectives established for key habitat areas. Use supervision would be done at a higher than average intensity. Low intensity of monitoring would be done on all "M" and "C" allotments except in areas of crucial wildlife habitat. Ecological site condition mapping would occur as in Alternative A.	Monitoring would be done only on those allotments where there would be grazing authorized under exemptions on public lands. No ecological site condition mapping would occur.	Same as Alternative A
<u>Vegetation Manipulation</u>					
Currently done through mechanical, chemical, and prescribed fire techniques. Approximately 5,000 acres of vegetation manipulation are proposed.	Approximately 82,610 acres of vegetation manipulation would be done. No projects are proposed in big game winter ranges or sage grouse nesting areas unless meets specific allotment objectives.	Approximately 136,960 acres of vegetation manipulation are proposed. Treatment may occur in big game ranges and sage grouse nesting areas to meet objectives for livestock production.	Approximately 33,500 acres are targeted for manipulation. Prescribed fire would be used for conversion of brush to grassland, where practicable. No manipulation would be proposed within one-quarter mile of sage grouse strutting areas.	No vegetation manipulation would be done.	Same as Alternative A

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>Interagency Cooperative Management Plans</u>					
There are currently no cooperative plans with the Forest Service in effect.	Interagency cooperative plans would be developed for these 4 allotments adjacent Forest Service allotments: Inchauspe, Hobbie Creek; and Pole Creek Allotments.	Cooperative plans would be developed on 5 allotments with Bridger-Teton National Forest: Trespass Creek; Inchauspe; Pole Creek; Hobbie Creek; and Mayfield Allotments.	No CMAs would be developed between FS and BLM.	Same as Alternative B	Same as Alternative A
<u>Non-allotted Public Land</u>					
Approximately 4,500 acres of unallotted public lands are not licensed to livestock grazing (646 AUMs). These AUMs would remain unlicensed.	Approximately 4,500 acres of unallotted public lands (646 AUMs) would be licensed under this alternative. Some of these lands may be disposed of by the lands program.	These 4,500 acres of unallotted lands would be made available for grazing by livestock. None of these acres would be disposed of by the lands program.	The 4,500 acres of unallotted public lands would remain unlicensed.	These lands would be offered for sale to adjacent landowners. Federal AUMs would be cancelled.	Same as Alternative A
<u>Conversion in Kind of Livestock</u>					
Conversions in kind would be done only after a suitability study and accompanying EA.	Conversions in kind will be done only after a study of suitability and accompanying EA, and only at proper conversion rates. Riparian areas would not be allowed to deteriorate due to conversions.	Same as Alternative A	Conversions in kind would only be allowed if the action would benefit wildlife and watershed resources. Return Smiths Fork Allotment to sheep use. Lambing areas on the Smiths Fork Allotment would be rotated from year to year. No conversions in allotments where riparian conflicts exist, without a management plan.	Same as Existing Management	No conversions from sheep to cattle will be allowed where riparian areas have problems until a plan is prepared to address riparian issues. Conversions would only be allowed after a suitability study and accompanying EA.

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>Riparian</u>					
Except for existing AMPs, grazing is continuous on riparian areas during season of use.	Grazing management on "I" category allotments would be for maintenance or improvement of current condition on riparian areas.	Same as Alternative A plus grazing practices would also be directed towards utilization levels which would maximize forage production without a decline in trend.	Develop grazing practices that show an improvement in riparian areas. May include AUM reduction based on carrying capacity of riparian areas alone, conversions or fencing. Utilization of key riparian grasses could not exceed 40%.	No special livestock related management would be necessary.	In allotments without grazing systems, set utilization of key riparian grasses at 60% as a term and condition of lease in all "I" allotments. Monitor "I" allotments and reduce utilization from riparian zone if 60% level is reached.
<u>Allotment Categorization</u>					
All allotments have been categorized to set management priorities.	Same as Existing Management	Same as Existing Management	Same as Existing Management	No categorization.	Same as Existing Management
<u>Cooperative Management Agreements (CMAs)</u>					
CMAs may be authorized on selected allotments and allow a livestock operator to manage livestock on an allotment, to achieve multiple use objectives identified for the allotment. Each agreement would be site specific and specify terms, conditions, and objectives to be met by the operator.	Same as Existing Management	Same as Existing Management with more emphasis on the process.	Same as Existing Management. However, only grant CMAs where they would enhance wildlife habitat or else have no affect on the habitat.	No CMAs for livestock would be developed.	Same as Existing Management
<u>WILDLIFE/RIPARIAN (Issue 5)^{4/}</u>					
All bridges and culverts crossing perennial drainages must be designed to allow fish passage.	No restriction	Same as Alternative A	Use bridges on perennial streams, stream stability structures (riprapping) should be included at time of construction.	Same as Existing Management	Same as Alternative C. Offsite mitigation would be required if onsite mitigation was ineffective.

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
No road construction within 1/4-mile of streams whenever possible.	No restriction	Same as Existing Management. Expand to limit construction in all riparian and wet areas.	Same as Alternative B	Same as Existing Management	Same as Alternative B
Raymond Mountain ACEC Woodruff Narrows HMP Overthrust HMP	Cumberland Wetlands HMP; Kemmerer Riparian HMP	Raymond Mountain ACEC; Woodruff Narrows HMP; Overthrust HMP	Raymond Mountain ACEC; Woodruff Narrows HMP; Cumberland Wetlands HMP; Overthrust HMP; Kemmerer Riparian HMP	Same as Alternative B	Same as Alternative C
4/ Management actions taken to resolve conflicts in wildlife/riparian areas are found under Issues 1, 2, and 4 as well as under this issue.					
<u>RECREATION (Issue 6)</u>					
<u>Recreation Potential</u>					
No BLM-developed sites. Potential sites include Commissary Ridge, Dempsey Ridge, Raymond Mtn., Pine Creek, Upper Smiths Fork, Hams Fork, and Meeks Cabin area.	Same as Existing Management	Same as Existing Management	RAMPs would be developed for Commissary Ridge, Dempsey Ridge, Raymond Mtn., Pine Creek, Upper Smiths Fork, Upper Hams Fork. Implement roads.	Fewer RAMPs and facilities.	Same as Alternative C
<u>ORVs</u>					
Resource area is open and unrestricted except in Raymond Mountain area.	Same as Existing Management	Same as Existing Management	KRA would be designated "limited" except for necessary tasks. Raymond Mtn. area will remain closed. Three road closures on Oregon Trail (1-mile segment on Westfall Hollow, 1-mile segment of rock slide area, 2-mile segment of Commissary Ridge). Match BLM ORV designations to Bridger-Teton and Wasatch Forest designations.	Same as Alternative C	Same as Alternative C except for Oregon Trail Commissary Ridge closure (to be decided during field season) and Rock Creek and Slate Creek elk winter range closure (to be decided on an annual basis).

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
			Close Slide Rock Trail. Close Rock Creek and Slate Creek elk winter ranges for snowmobile use (12/1 - 5/1). Evaluate use of Pine Creek Road.		
<u>Raymond Mountain WSA</u>					
Raymond Mtn. WSA is presently managed under interim management for wilderness (32,936 acres). Wildlife ACEC located in WSA (13,530 acres). ORV closure in Raymond Canyon and on IGO Speedway.	WSA would be open to oil and gas leasing with standard stipulations if Congress decides against wilderness designation. ACEC will be dropped.	Same as Existing Management	ACEC will remain in effect. ORV closures would remain. Stipulations on leases would protect recreation and wildlife values.	Same as Alternative C	Same as Alternative C
<u>LAND TENURE (Issue 7)</u>					
Star Valley lands would be disposed of by sale, transfer, exchange, or R&PP.	Same as Existing Management	Management of Star Valley lands would be transferred to the Idaho BLM or USFS, grazing rights would not be cancelled.	Star Valley lands with wildlife values would be retained in Federal ownership or reservations to the patent would be made to protect wildlife values.	Lands in Star Valley with significant wildlife values would be retained in Federal ownership and transferred to Wyoming Game and Fish Department.	Same as Existing Management
In the rest of the KRA, excluding Star Valley, the lands (which appear to meet disposal criteria) would be considered for disposal.	These lands would be sold if it would not hinder energy development.	Lands with grazing values would be retained, parcels without legal access would be sold to or exchanged with the lessee.	Lands in crucial wildlife habitat would be retained.	Lands which have grazing improvements that are essential to private ranching may have patent reservations for those improvements.	Same as Existing Management
				The BLM land requested by the Wasatch National Forest would be transferred to the USFS.	

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>RIGHTS-OF-WAY (Issue 8)</u> ^{5/}					
Seasonal stipulations: Crucial Winter Range Elk Calving Areas Sage Grouse Strutting/ Nesting Grounds Lambing Areas Raptor Nesting Areas Exceptions may be permitted by the Authorized Officer.	Seasonal restrictions would be replaced with "contact the Auth- orized Officer be- fore commencing activity".	Seasonal restrictions on lambing areas with no exceptions granted for construction.	Generally, no excep- tions to the seasonal stipulations for: Crucial Winter Range Elk Calving Areas	Seasonal stip- ulations for: Crucial Winter Range Elk Calving Areas Sage Grouse Strutting/Nesting Areas Exceptions for special circumstances.	Same as Alternative C except that waiver of the stipulation could occur on a case-by-case basis as under Existing Management.
^{5/} Dates for seasonal stipulations are discussed under Geophysical (Issue 1) and Oil and Gas (Issue 2).					
Special stipulations on a case-by-case basis.	Special stipulations only when absolutely necessary.	Certain ROWs would: 1) be fenced 2) have linear access blocked 3) have secondary seeding for livestock.	Same as Existing Management	Same as Existing Management	Same as Existing Management
No year round avoidance areas.	No year round avoid- ance areas.	No year round avoid- ance areas.	T&E species habitat and raptor nest sites would be designated as "no surface disturbance". Crucial winter range would be designated "minimal access areas".	No year round avoid- ance areas.	Same as Alternative C
Individual com- munication site grants.	Communication site grants with sub- granting rights.	Same as Existing Management	Same as Alternative A	Same as Existing Management	Same as Alternative A
<u>ACCESS (Issue 9)</u>					
No comprehensive acquisition plan. Access needs are handled by the District Office as they occur.	Access priorities for: Meeks Cabin and Raymond Mountain.	Access priorities for: Star Ranch, Muddy Creek, north end of Lake Viva Naughton, Smiths Fork Road, Dee Ranch Road, and Warfield Springs.	Access priorities for: Meeks Cabin, Raymond Mountain, Coal Creek Road, and an alternate access to Pine Creek.	Access priorities for: areas which would benefit multiple programs.	Access priorities for: Meeks Cabin and Raymond Mountain. Access for program needs on a priority basis.

Table 2-1

Existing Management	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<u>FIRE MANAGEMENT</u>					
Full suppression of all wildfires.	Wildfires would be managed by full suppression. Limited suppression on prescribed fire tactics as per parameters identified in fire management plan.	Same as Alternative A	Same as Alternative A	Same as Alternative A	

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be practical or economically feasible, particularly in the areas where public lands are heavily interspersed with private land. It would also not be feasible to require ranchers to control their livestock to keep them off unfenced public land. The costs would be too great for the ranchers and the Bureau. All lands would have to be marked and an intensive monitoring and enforcement program would have to be started. Alternative D does not allocate any forage from public lands to livestock but allows livestock operators to use public lands and their lands, in combination, up to the level they are currently using their private lands.

4. Raymond Mountain Wilderness Study Area (WSA) The Raymond Mountain WSA was analyzed in the Rock Springs District Wilderness EIS. The area was recommended as unsuitable for wilderness designation. It is assumed that Congress will agree with the recommendation and also recommend the WSA as unsuitable for wilderness. Since the WSA has previously been analyzed in detail, wilderness designation has been eliminated from further evaluation in this document. Conditions have not changed and the recommendation made in the Wilderness EIS remains unchanged.

MANAGEMENT COMMON TO ALL ALTERNATIVES

This section describes resource allocations and management practices that are currently in effect in the KRA and are working well. Such management direction is not related to the planning issues. This section also contains management direction for programs where recent decisions are still current and meet legal, statutory, and regulatory requirements (e.g., NEPA, FLPMA, and recent changes in applicable regulations). Alternatives were not normally developed for these components of the plan. They are described here to reduce duplication. They were considered a part of each alternative analyzed in detail.

After a plan has been approved, actions will be considered in conformance with the plan if they: 1) are specifically provided for in the plan; 2) are consistent with the provisions of the plan; or 3) are not specifically prohibited and are not inconsistent with other actions which are specifically provided for in the plan.

The alternatives analyzed propose certain specific measures (e.g., protective stipulations) to mitigate environmental impacts from certain kinds of actions. These specific measures were identified using existing data and management practices. They were used to help in the analysis of impacts. If future information demonstrates that different specific measures are necessary to mitigate the same environmental impacts, the change in the specific measures would generally be considered in conformance with the plan. Such a change would generally be consistent with the terms, conditions, and decisions in the plan and would usually be considered maintaining the plan. Maintenance is not considered a plan amendment and would not require formal public involvement and interagency coordination (43 CFR 1610.5-4) or the preparation of an environmental assessment or an environmental impact statement.

AIR QUALITY

Air resources are protected in the KRA in several ways. As major sources of air pollutant emissions are planned, special air quality protection related stipulations are added to BLM grants of rights-of-way necessary for construction. In addition, the BLM coordinates with the Wyoming Department of Environmental Quality, Air Quality Division (WDEQ, AQD) during the issuance of permits to construct emission sources. This coordination often results in the technical review of applications for permits and commenting on or requesting the addition of stipulations to these permits. Emission of smoke from controlled BLM burning is also coordinated with the AQD, with approval being granted by that agency.

The BLM is also very concerned about the potential impacts of the release of hazardous air contaminants. Of special attention has been the question of accidental release of sour (H₂S rich) natural gas. BLM requires industry to prepare detailed analyses of risks involved with the development of sour gas pipelines and treatment facilities. These analyses are designed to project impacts both to the public and to resource values. Through analyses prepared by industry and by BLM, public safety considerations are fully integrated into the BLM planning process.

Bureau specialists are also involved in the collection of basic climate and meteorological data useful to air resource management and

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many other technical disciplines. Examples of this are remote automatic weather stations, a type of fully automated station which collects weather data 24 hours per day for 365 days a year, and precipitation gauges. To complement the data from these sources, data are also received from industrial sources and other agencies. These data are used to make informed decisions on resource management. In addition to climate/weather data, BLM is collecting atmospheric deposition (acid rain) data at three sites in Wyoming. These data are useful in determining actual or potential impacts resulting from air pollutant emissions.

GEOLOGY AND MINERALS

Oil and Gas

As oil and gas leases are cancelled, expire, or otherwise terminated they will, in most cases, continue to be re-offered for lease. No leases will be re-offered in Raymond Mountain Wilderness Study Area due to a Secretarial Order. If leases are in an area of known geologic structure (KGS), which is an area known to be capable of producing hydrocarbons, they will be offered through competitive leasing. If they are not in a KGS, they will be offered through the simultaneous leasing program, in which a lottery is used to determine the successful applicant. In either system, stipulations will be attached to the leases before they are issued. The standard stipulations used in the leasing process are listed in Appendix B-1. Additional special stipulations may be added if justified, but the standard ones are preferred. The types of special stipulations which may be added are described under each of the alternatives. Applications for Permits to Drill (APDs) will continue to be processed within the existing required time frames, with site-specific conditions added as needed. The standard conditions that will be added to all APDs are listed in Appendix B-1. In the Raymond Mountain Wilderness Study Area (WSA), environmental analysis and extended processing time will be required for APDs. Geophysical Notices of Intent will continue to be processed. These are submitted by oil companies and geophysical companies for oil and gas exploration. Seasonal restrictions will be added to the Notices if necessary. In the Raymond Mountain WSA, only those operations that meet the "non-impairment" standards (e.g., portable seismic operations) will be permitted off of existing trails. All Notices will be issued with standard conditions (Appendix B-1).

Coal

A Coal Amendment to the Pioneer Trails MFP was completed in March, 1982. Due to recent changes in the Federal coal regulations and to resolution of BLM's appeal of the Flannery Decision (concerning the validity of applying the coal unsuitability criteria to existing Federal coal leases), an updated planning review of the 1982 coal management decisions was conducted for the purposes of this RMP. The net result of this review was no change in the 1982 decisions for unleased Federal coal areas in the KRA. The current decisions for managing the Federal coal resource in the KRA have been incorporated in this RMP as part of the "Management Common to All Alternatives."

Appendix B-2 is a complete summary of the Federal coal management planning that has been conducted in the KRA, to date. It describes the coal planning process and procedures used for both the 1982 amendment and the updated RMP review, the alternatives to the 1982 coal decisions that were considered, the findings of the coal screening process, the status of the Federal coal leasing program activities that have occurred in the KRA since 1982, and the current Federal coal management planning decisions for the KRA.

Sodium

Decisions covering sodium development are in a current amendment to the Pioneer Trails MFP (May 1982). They are as follows:

1. Open all lands within the Known Sodium Leasing Area (KSLA). Apply the limited surface occupancy criteria contained in the District Trona Analysis and Stipulations Staff Report on a case-by-case basis. This analysis is available in the Rock Springs District Office.
2. Approve pending and future prospecting permit both in and outside of the identified geologically distinct area immediately surrounding the KSLA (i.e., the geologic basin occupied by Lake Gosiute during Eocene time).

Oil Shale

Oil shale data will be added to existing inventory data to provide information for possible future leasing.

Phosphate

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Phosphate prospecting permits will be processed in all areas, with appropriate stipulations added to protect other resources. Issuance of a lease and review of a mining plan will also require stipulations.

Locatable Minerals

Mining claims constitute an unusual situation in Management Common to All Alternatives, since management discretion is limited. For example, the issuance of leases for coal, oil and gas, etc., are discretionary, i.e., they may or may not be issued. Mining claim locations, however, are initiated by the claimant, and unless they are improperly located, they are accompanied by certain rights that cannot be overridden, including the right to mine the claim if a valid discovery exists. The BLM will continue to require a Notice of Plan of Operations to describe mining proposals, help mitigate environmental impacts, and prevent unnecessary and undue degradation. Additional review in the Raymond Mountain Wilderness Study Area will conform to applicable guidelines (43 CFR 3802).

Salable Minerals

Salable mineral permits will be processed on a case-by-case basis, with stipulations added to protect other resources.

Geologic Hazards

In areas of known geologic hazards (Map A), such hazards will be considered in land use authorizations and appropriate mitigating measures will be developed.

Paleontological Resources

Operations causing disturbance to vertebrate-bearing zones in the Green River Formation will require a paleontological survey by a qualified paleontologist, and mitigating measures will be instituted. The following stipulation will be attached to all actions:

"If paleontological resources, either large and conspicuous, and/or of significant scientific value are discovered during construction, the find will be reported to the Authorized Officer immediately. Construction will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM approved professional paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological values. Operations within 250

feet of such a discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The applicant will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations."

SOILS

General

Management of the soil resource will continue to be prioritized and based upon the following: 1) Evaluation and interpretation of soils in relation to project design and development; 2) Identification and inventory of soils for baseline data; 3) Identification and implementation of methods to reduce accelerated erosion; and 4) Provide soil data in support of rangeland monitoring, inventory and project design, and development.

Evaluation and interpretation involves identification of soil properties which affect manipulation of the resource and recommendations for development while minimizing soil loss. Projects will be examined on a site-specific basis, evaluating the potential for soil loss and the compatibility of soil properties with project design. Stipulations and mitigating measures are provided on a case-by-case basis to insure soil conservation and practical management. Projects requiring soil interpretations include: construction of linear right-of-way facilities (i.e., pipelines, roads, railroads, and power transmission lines); construction of water impoundments; rangeland manipulation through fire or mechanical treatments; construction of plant site facilities, pump stations, well pads and associated disturbances; and reclamation projects.

The current inventory is designed to update general information and provide data in areas lacking soil surveys. A baseline soil inventory will be conducted to provide information on potential productivity (range and forestry), soil engineering properties, and soil erosion potentials. Proposed "I" category allotments and areas impacted by proposed projects receive priority in the soil survey process. Soil surveys will follow the standards of, and contribute to the National Cooperative Soil Survey.

Accelerated soil erosion from runoff from disturbed areas presents the most serious problem to the soil resource and to water quality. Diffuse salinity sources in the form of surface runoff and sediment load from erosion are

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contributors of salts to the Green River drainage. Identification of critical erosion condition areas will continue during soil surveys, monitoring, and AMP development for the purpose of avoidance and special management. Development will be discouraged in these areas and watershed management will include protection and enhancement of existing vegetation.

Soil moisture and temperature baseline data will be gathered in conjunction with range monitoring to provide information on growing season length and effective precipitation. These data will be utilized in range site productivity and climate analysis. Additional use of soil moisture and temperature data will include development of: soil survey temperature and moisture regimes, prescribed burn plans, reclamation procedures, and restrictive seasons for geophysical exploration and general construction.

Reclamation

BLM reclamation goals emphasize: 1) protection of existing vegetation; 2) minimal disturbance of existing environment; 3) stabilization through establishment of ground cover; 4) establishment of vegetation consistent with land use planning; and 5) reduction of visual contrast.

All reclamation is expected to be accomplished as soon as possible after the disturbance occurs, by the lessee or grant holder responsible, with efforts continuing until a satisfactory vegetation cover is established and the site is stabilized. Before disturbance, the BLM shall determine total topsoil depth on proposed projects. This depth along with topsoil placement will be specified in stipulations. Where possible, topsoil will be piled in a linear fashion, mulched as necessary, and seeded to reduce wind and water erosion and soil micro-organisms depletion. Stockpiles remaining less than two years are best for soil micro-organism survival. Areas used for spoil storage shall have the topsoil stripped before spoil placement and returned after spoil removal. All topsoil will be distributed uniformly over area to be reclaimed unless conditions indicate varying depth.

Land grading will be conducted only on the area required for construction. Trees, shrubs, and ground cover not to be cleared from rights-of-way will be protected from damage during construction. Backfill will be replaced in a similar sequence and density to preconstruction soil condition. Original contours will be restored to permit normal surface drainage. A friable but firm

seed bed will be prepared prior to all seeding. Any mulch used will be free from mold, fungi, or noxious weed seeds and should contain fibers at least 8 inches long.

Only species adaptable to local soil and climatic conditions will be utilized. Followup seeding or corrective erosion control measures are required on all disturbances experiencing reclamation failure. All noxious weed infestation on surface disturbance will be the responsibility of the grantee or lessee. All noxious weed control will adhere to measures allowed in the Rock Springs District Noxious Weed Control EA.

Roads

Recognized roads, as shown on the RSDO Transportation Plan, will be used when the alignment is acceptable for the proposed use. All other roads will follow natural contours and be constructed in accordance with acceptable standards and reclaimed to BLM standards. Cut and fill slopes will be seeded as soon as possible to avoid excessive erosion (except where bedrock surfaces). On permanent roads, topsoil will be used to establish vegetation on both cut and fill slopes. Side casting of material on steep slopes will not be allowed. All roads on steep slopes will be designed cut and fill. All temporary roads (not kept for access) must be obliterated and reclaimed. Structures such as bridges, culverts, cattleguards, and signs must be removed. Reclamation may include obliteration of fills and cuts, water barring, erosion control matting, mulch, and road barriers to discourage travel.

Well Pads and Plant Facilities

Abandoned sites must be satisfactorily rehabilitated (determined by the BLM) by the lessee responsible. Soil samples will be collected from disturbances and analyzed to determine reclamation potential, appropriate reseeding species, and nutrient deficits. Testing may include: pH, mechanical analysis, limiting salt content, and nitrogen, phosphorous, and potassium (as determined by BLM). Areas not used for production purposes should be backfilled and blended into the surrounding terrain, reseeded, and erosion control measures installed. Terraces or elongated water breaks will be constructed after slope reduction. Disturbances will have facilities to approach zero runoff from the location until the area is stabilized (to avoid contamination downstream). All excavations, pits, or drill holes shall be closed by backfilling and contouring to

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conform to surrounding terrain. Site-specific reclamation plans will be developed as requested by point 10 of the Surface Use Plan (reference in 43 CFR 3160, 1983).

Pipelines and Communication Lines

Routes will take advantage of current road locations to minimize surface disturbance. When pipelines and communication lines are buried, there will be at least 30 inches of backfill on top of the pipe. Backfill will be compacted for ground stability by tamping or by using a wheeled vehicle. Backfill shall not extend above the original ground level after the fill has settled. Water bars, mulching, and terracing will be used as needed to prevent erosion. Drop structures or small detention dams shall be constructed in drainages crossed by the pipeline to prevent excessive erosion. Guides for construction and water bar placement are found in "Surface Operating Standards for Oil and Gas Exploration and Development" (USDI, 1978). All disturbed areas with a slope exceeding 15 percent, shall be mulched, examples of which include: native hay, hay of introduced grass species, small grain straw, wood fiber, live mulch, cotton, jute, or synthetic netting, and rock.

Bladed surface materials will be respread upon the cleared route once construction is completed. Disturbed areas that have been reclaimed will be fenced when route is near livestock watering areas (distance determined on site-specific basis). The construction of pipelines and communication lines would be accomplished with the least degree of disturbance to topsoil.

WATER RESOURCES

Water quality and quantity will be managed to comply with, and possibly exceed, State and Federal water quality standards. This will be accomplished by carefully reviewing proposed activities and developing mitigating measures to prevent degradation of the water resources. Actions involving municipal watersheds will be designed to protect and enhance the resources. The contribution of salinity problems in the Green River Drainage will be of prime concern. Measures such as avoiding highly erosive areas, implementing zero runoff programs on large scale disturbances, and reclamation of all abandoned surface disturbances will be enforced. Watersheds within the Green River Basin will be sampled to identify salinity

problems. Where noted, water quality plans will be developed to comply with the Colorado River Basin Salinity Control Act of 1974. Exploration holes will be properly plugged to prevent groundwater contamination.

LIVESTOCK MANAGEMENT

Weed and Pest Control

Cooperation with county weed and pest control programs will continue. These programs were analyzed in the Rock Springs District Weed and Pest Control EA.

Current Land Use Planning

Several range management decisions from the Pioneer Trails Management Framework Plan have yet to be implemented. Those which are common to all alternatives include:

1. Retain approximately 6,160 acres of public land designated as administrative stock trails. These trails will be maintained under all alternatives to provide access between public or private land permits or leases and Forest Service permits.
2. Predator control will continue in accordance with the Rock Springs District Animal Damage Control Plan.
3. No herds of wild and free-roaming horses will be maintained on the KRA.

Range Improvements

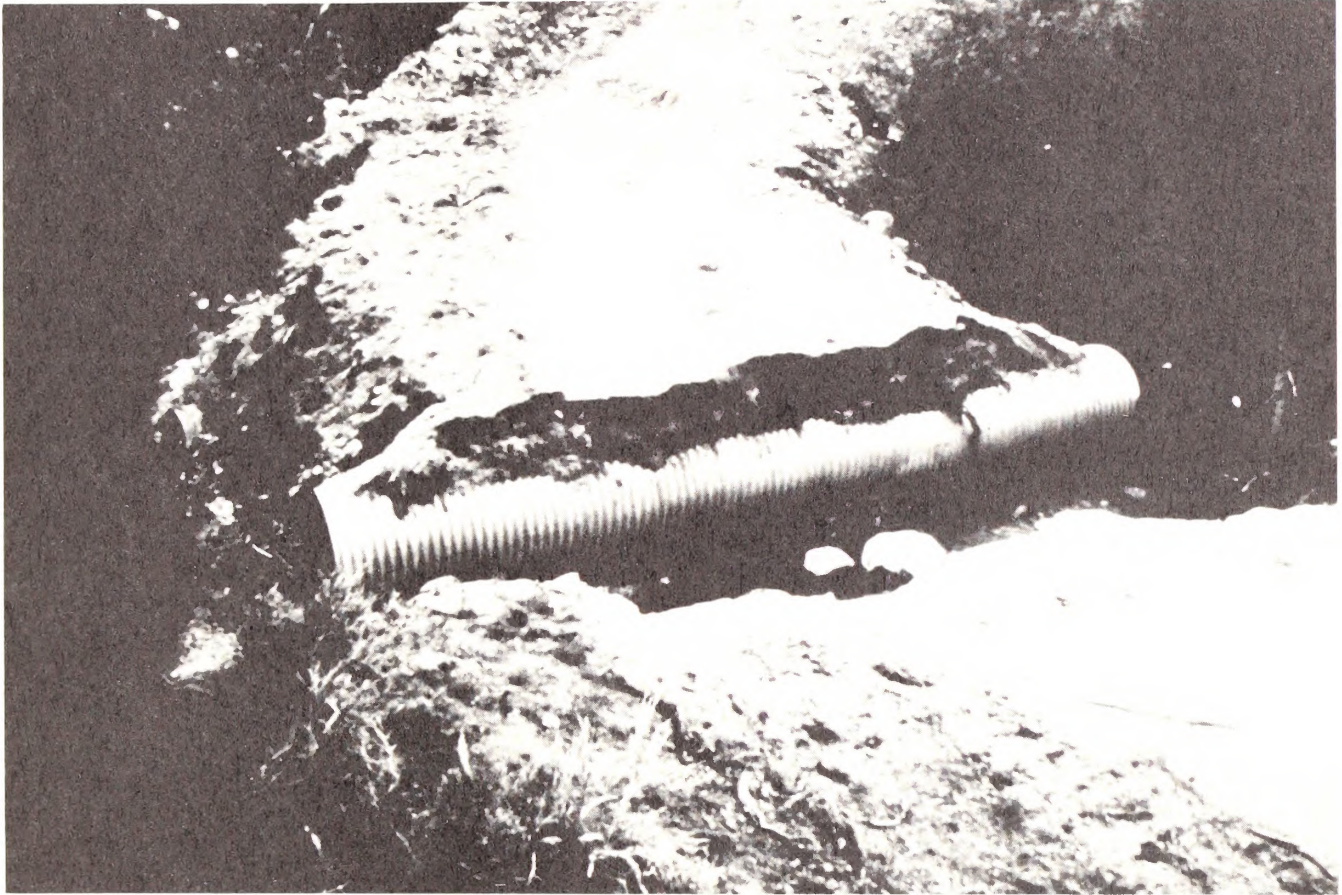
Appendix A-1 describes the standard operating procedures for range improvements and vegetation manipulations.

FISH AND WILDLIFE HABITAT

Fish and wildlife habitat will be evaluated on a case-by-case basis as part of overall project planning. Such evaluation will consider the proposed project and the sensitivity of fish and wildlife habitat in the affected area.

Existing fences may be modified and new fences will be built to allow wildlife passage. Water developments generally will not be established for livestock where significant conflicts over vegetation would result (i.e., big game winter range). Whenever possible, water will be provided in allotments (including rested

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Washed-out culverts from poorly designed roads

pastures) during seasonal periods of need for wildlife.

Vegetation manipulation will be designed to minimize impacts to wildlife habitat and to improve it whenever possible. The Wyoming Game & Fish Department will be consulted in advance on all vegetation manipulation projects. Animal damage control programs will be coordinated with the U.S. Fish and Wildlife Service.

Riparian and Wetland Areas

Management actions within riparian areas and wetlands will include measures to preserve, protect and, if necessary, restore natural functions (as required by Executive Orders 11988 and 11990). Management techniques will be used to minimize the degradation of stream banks and loss of riparian habitat. Bridges and culverts will be designed and installed to maintain adequate fish passage and prevent headcutting. Riparian habitat needs will be considered when developing livestock grazing systems and pasture designs. The following techniques may

be used to reduce adverse impacts: implementing grazing systems or herding livestock to provide deferment or rest during the growing season, locating salt away from riparian areas, locating fences so that livestock are not concentrated on riparian areas, and developing alternate water sources.

Riparian shrub vegetation will be re-established on 200 acres of riparian area in the Thomas Fork drainage. Wetland areas for waterfowl production and sage grouse brood rearing areas will be inventoried and improved. Stream habitat improvement practices to improve fisheries habitat will be implemented.

Threatened and Endangered Species

No activities that would jeopardize the continued existence of threatened and endangered (T&E) species will be permitted in habitat for those species. The Wyoming Game and Fish Department and the U.S. Fish and Wildlife Service will be contacted prior to implementing projects that may affect habitat for threatened and endangered species. If a "may

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effect" situation is determined through the BLM biological assessment process, formal consultation with the USFWS will be initiated according to Section 7 of the Endangered Species Act of 1973, as amended.

Thomas Fork HMP

The objectives of the Thomas Fork HMP are to improve habitat for the Bonneville or Bear River cutthroat trout and maintain or improve associated riparian areas in the Thomas Fork drainage. The following management actions have already been implemented: livestock exclosures, livestock grazing systems (study basis), instream habitat improvement structures, and riparian shrub plantings. Full implementation of short-term objectives is scheduled for completion by fiscal year 1985.

Rock Creek HMP

The objectives of the Rock Creek HMP are to improve habitat condition for mule deer and elk in the Rock Creek winter range. Specific actions include vegetation treatment and control of livestock. Specific actions will either be implemented in their present form or will be modified through coordination with the Wyoming Game and Fish Department (Sikes Act HMP).

Inventory and Monitoring

All important wildlife habitat will be monitored whenever possible to determine seasonal habitat use and identify areas in need of habitat improvement. These areas include big game winter ranges, riparian areas, sage grouse strutting/nesting areas, wetlands, T&E species habitat, and non-game habitat. These data would be used to base site-specific management decisions on a case-by-case basis. For example, application of a wildlife restriction on geophysical exploration might vary depending on the location of wintering big game as determined through monitoring flights.

Inventory to locate important wildlife habitat will be conducted as funds are available. Priority will be given to T&E species inventory, especially black-footed ferrets. Surveys will be conducted in areas with a relatively high probability of supporting ferrets, such as locations with recent sightings, physical evidence, or a high population of prairie dogs. Other wildlife habitat lacking complete information in the KRA includes raptor nest sites, sage grouse strutting grounds, and site-specific vegetation data.

Habitat for elk, mule deer, and moose will be improved using prescribed fire and clear-cutting. Approximately 30,000 acres of sagebrush will be converted to grass on elk winter ranges in the Rock Creek and Slate Creek areas.

The following wildlife and fisheries decisions will be carried forward from previous plans. Water will be provided in the Opal and Chrisum bench areas to provide water for antelope, sage grouse, and livestock. Big game winter range will be improved using mechanical treatment, burning, or other vegetation manipulation methods. This decision has been expanded to include all big game winter range in need of habitat improvement. The Leroy, Crawford, and Bear River Divide will still receive high priority. Seasonal motorized vehicle closures will be instituted to protect big game winter range.

RECREATION

Recreation Potential

Developed BLM recreation sites within the KRA are non-existent. Recreation activities such as hunting, fishing, snowmobiling, camping, picnicking, and ORV use are popular throughout the KRA. Hunting and related activities (ORV use and camping) are the most intensive. The Raymond Canyon Trail will continue to remain open to foot traffic, horses, range chores, etc. (except ORV use). The trail will be maintained in a manner conducive to public health and safety. Funding for recreation management is anticipated to continue at low levels, however, special recreation use permits will continue to be processed. Recreation resources will continue to be evaluated on an individual basis as part of project level planning. Such evaluation will consider the significance of the proposed project and the sensitivity of recreation resources in the affected area. Stipulations will be attached, as appropriate, to assure compatibility of projects with recreation management objectives.

The Bureau's primary recreation management goal is to ensure the continued availability of outdoor recreation opportunities which the public seeks and which are not readily available from other public or private entities. Additional goals include protecting resources, meeting legal requirements for visitors health and safety, and mitigating resource user conflict involving recreation.

A recreation area management plan (RAMP) is being developed for the Oregon and Mormon Trails and the major cutoffs that traverse the KRA. The cultural aspects, recreation

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opportunity, and management prescriptions will be identified in the document.

Recreation development is not anticipated, however, the recreation potential for future development (Appendix H) will continue to be monitored, protected, and evaluated. When proposed projects are evaluated, the sensitivity of recreation resources in the affected area will be considered. Stipulations will be attached to projects, as appropriate, to assure compatibility with recreation management objectives including the potential for recreation development. Recreation will utilize other kinds of projects to facilitate use of recreation resources. For example, access roads may be rerouted to either provide access to recreation resources or to avoid adverse impacts to recreation values.

The KRA has one hunting outfitter permitted under a special recreation use permit operating in the Raymond Canyon area. All such permit applications will continue to be processed on a first come - first served basis in accordance with 43 CFR 8370.

Other decisions from previous planning efforts will be brought forward under all alternatives. All significant historic, archaeologic, and cultural sites will be protected. Erosion on Johnston Scout Rock will be stabilized. Title to Emigrant Springs (Slate Creek) will be acquired, interpretive signing will be developed, erosion will be stabilized, and the stock water pond will be relocated.

Erosion on the Nancy Hill headstone will be stabilized. Interpretive signs will be placed at the Alfred Corum and Nancy Hill graves and at nearby ruts of the Oregon Trail. Campground development at Emigrant Springs (Dempsey) will be considered as a part of total development.

Visual Resources

Visual resources will continue to be evaluated as part of activity and project planning. Such evaluation will consider the significance of the proposed project and the visual sensitivity of the affected area. Stipulations will be attached as appropriate to assure compatibility of projects with management objectives for visual resources. Management activities within visual classes of I through IV should only be allowed when that activity complies with constraints identified for each classification.

Raymond Mountain Wilderness Study Area

The Raymond Mountain Wilderness Study Area will continue to be managed in compliance with the Interim Management Policy until it is reviewed and acted upon by Congress. Currently, a Department of Interior secretarial decision and appropriation act language prohibit issuing new leases for oil and gas in a wilderness study area.

Develop a recreation area management plan (RAMP) for the Raymond Mountain WSA. Consider current and anticipated recreation use levels, activities, and areas of concentration. Enhance the outdoor recreation experience and protect the resource base by providing access and collecting visitor use data.

LAND RESOURCES

The following is a description of the various land actions available to the KRA staff to authorize the use of the land resource. Documentation of NEPA requirements is done through an environmental document, which generally utilizes public input. A land report is written to provide the BLM management with an analysis of the legal authorities and options available. A review of conformance with existing planning documents is also made.

Land tenure adjustments require that local government and the public are provided an opportunity for comment, as well as being consistent with local planning and zoning. Most large projects rights-of-way have State and local government permitting requirements. Examples of these are: Lincoln County requires building permits; and the State of Wyoming requires Air Quality Permits. If a project exceeds a certain monetary investment threshold, an industrial siting permit from the State is required.

Land Tenure Adjustment

The Bureau has, in previous land use plans, identified land that is suitable for disposal. This included parcels of public land in Star Valley, isolated tracts in the rest of the KRA, and areas needed for community expansion. Most of these lands were either identified before the passage of FLPMA or were not analyzed in detail. To satisfy the requirements of FLPMA, field studies and site-specific analyses will be conducted prior to disposal. There are two steps involved in identifying a parcel for disposal. The first is the initial categorization for disposal or retention. This is a screening process that separates the land suited for retention from that which may be

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suitable for disposal under criteria defined in Section 203 of FLPMA. Lands which meet the disposal criteria of Section 203 of FLPMA are then analyzed on a site-specific basis under NEPA requirements.

The types of land tenure adjustment actions considered are sale, R&PP leases or patents, exchanges, and transfer for management by other Federal agencies. An environmental assessment/land report (EA/LR) is a document which assesses the impacts a disposal action would have on public values and resources. These values include wildlife, threatened and endangered species, cultural resources, environmental quality, minerals, timber, the interests of the grazing permittees, the adjacent landowners and the local community. The EA/LR also addresses the specific criteria of the regulations for each type of lands action. Public lands that are to be disposed of by sale must meet the following criteria established by FLPMA (described under planning criteria No. 4 under Lands Management).

Other criteria for land tenure adjustments can be located under FLPMA Section 206 (exchanges), Section 212, Recreation and Public Purposes Act of 1926, as amended, 43 CFR regulations, or BLM manuals and directives.

When an EA/LR determines that a parcel is suitable for sale or exchange would benefit the public a Notice of Realty Action (NORA) is published in the Federal Register and for three weeks in a local newspaper. All State and local government officials, appropriate Congressional committees and representatives, adjacent land owners and interested parties are also notified by a direct mailing of the NORA.

The NORA details the proposed realty action, restrictions that would be placed on any title, deed, or lease issued. The disposition of grazing rights, minerals, or surface use rights, and the fair market value of the parcel of public land. The NORA allows for a public comment period of 45 days.

Rights-of-Way

A right-of-way includes an easement, lease, permit, or license to occupy, use, or traverse public lands granted for purposes authorized by FLPMA, the Mineral Leasing Act of 1920, as amended, and several other public land laws. On an average, approximately 150 to 200 rights-of-way are processed each year. Of these, the majority are processed under FLPMA and the Mineral Leasing Act of 1920.

Rights-of-way to service producing oil and gas pipelines or transporting oil or gas are issued under authority of the Mineral Leasing Act. Other energy-related rights-of-way are issued under Title V of FLPMA. Examples would be powerlines, access roads to serve an oil and gas well or a coal mine. Non-energy related rights-of-way, like communication sites, telephone lines, or water pipelines are also issued under FLPMA authorities.

Rights-of-way are processed in the order the applications are received. If circumstances warrant (e.g. an oil and gas lease will expire), BLM management may give an application priority over others. Part of processing a right-of-way application is compliance with NEPA. While preparing an environmental analysis, mitigating measures are developed to restore or protect environmental values.

Temporary Use Permits

Temporary use permits (TUPs) can be issued to provide for temporary construction areas not necessary for permanent operations or maintenance of a project constructed on a right-of-way. TUPs are authorized under the legal authorities cited above.

Recreation and Public Purposes (R&PP) Act

The R&PP lease applications or patent requests authorize the use of public lands by State and local government units and agencies and non-profit associations for recreation and public purposes. Some examples are parks, schools, sanitary landfills, gun ranges, and wildlife feedgrounds.

Applications are reviewed for compliance with development and management plan requirements outlined in BLM guidance manuals. The BLM then completes all required NEPA and internal reviews. Public comment is sought similarly as described under land tenure adjustment above. The BLM publishes a classification decision to secure public comment. Present BLM policy is to make public land available and assist local government agencies in developing the necessary paperwork to accomplish the issuance of R&PP leases.

Exchanges

Exchanges are lands actions where the trading of public lands or interest in public land occurs after the BLM makes a determination that the

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public interest will well be served. The determination shall give full consideration to better Federal land management and the needs of State and local public (economy, community expansion, recreation). Similar procedures are used to accomplish an exchange and provide for public comment as described under land sales.

Withdrawals and Withdrawal Reviews

Withdrawals are described as withholding an area of Federal land from settlement, sale, location, or entry under some or all of the general land laws. Withdrawals limit activities under those laws to maintain other public values or to transfer jurisdiction over an area of land from one Federal agency to another.

Under FLPMA, the BLM must complete a review of existing withdrawals to determine if they should be continued or restored to management under the public land laws. Withdrawals that are not necessary to protect public land values are generally revoked and the public lands are restored to full operation under the public land laws. New withdrawals require a detailed analysis and a public hearing be held if significant interest is expressed by the public. There are certain specific requirements for new withdrawals (Section 204 of FLPMA and 43 CFR 2310).

Other Land Actions

Desert Land Entries (DLE) are lands actions allowing entry of public lands to reclaim arid and semi-arid lands by using irrigation methods. One of the requirements to acquiring a DLE is demonstrating proof of water rights. Few applications have been filed in the KRA. The same reports and publications are required as the above lands disposal actions.

Color of Title

Color of title actions involve a parcel of public land that a person has held in good faith for more than 20 years and has completed valuable improvements or has cultivated, or a person or his ancestors have paid property taxes on since 1901. Field reports and public notifications are accomplished similarly to other lands actions. Generally, in the KRA this lands action is very limited.

Leases/Permits/Easements

As described in 43 CFR 2920, leases, permits, and easements are surface use authorizations for uses that are not specifically authorized under other public land laws and not specifically forbidden by law. Leases are generally processed for uses that require substantial investment in improvements. Permits are issued for uses not to exceed three years. Easements are used to ensure uses on public lands are consistent with adjacent private lands. Environmental concerns and public comment are considered in the same manner as for other land use actions.

Unauthorized Occupancy

Due to the lack of proper survey of private and public lands prior to some developments, occupancy of public land without authorization has occurred. During the last five years approximately 50 separate incidents have occurred. Because the occupancy of public lands is unlawful, the KRA has taken actions to remove or authorize the unauthorized occupancy of public lands.

In order to prevent the development of occupancy trespass situations, the KRA insists that energy project proponents provide crew quarters on or near the construction site.

Upon discovery of private development on public lands, there are two options available to the BLM: 1) Authorize the structure through lease or sale of the public land after payment of damages, or 2) Require the removal of the structure or reclamation of the disturbance and payment of damages. Treatment of unauthorized occupancy is decided on a case-by-case basis and is generally resolved promptly upon discovery.

FORESTRY RESOURCES

Activity plans (Forest Management Plans), including the annual and the five-year timber sale plan, will be prepared for the KRA.

Silvicultural treatments for all productive forest areas will be identified to improve the condition and the productive capacity of the stands.

Clearcuts are generally limited to no more than 25 acres in size. Exceptions may be made with

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State Office approval. Exceptions would be insect or disease infestations. Normally, large areas of decadent timber would not be an exception. Clearcuts are laid out considering stand characteristics, topography, and other resource values. The units are irregular in shape and probably average about 15 acres in size.

The KRA will meet public demand for minor forest products within funding capabilities.

Areas of new seedling establishment will be inventoried at specified intervals; areas not meeting stocking standards will be reforested using native species. Silvicultural treatments will be identified for specific aspen areas in order to improve the stands. Possible treatment would include burning, chaining, cutting, or shearing. Rehabilitation surveys will periodically take place on old logging and fire areas to determine if regeneration is sufficient to assure proper stocking of a new timber stand. The effects of grazing on reproduction will also be assessed and remedial action will be taken, if needed, to protect reproduction, i.e., fencing. Areas will be planted if adequate natural forest regeneration does not take place after 15 years, and it is apparent that natural regeneration will not become established.

Forest management practices will be directed to prevent insect or disease infestations.

Legal access will be sought to areas which will be intensively managed for timber production. Temporary easements may be used for specific actions for short time periods.

Road development will be kept to a minimum and locations and specifications will be selected to meet the transportation need, safety requirements, and consideration of other resource values. Timber harvest and associated activities will be planned in a sequence that will be least disruptive to wildlife.

The selective tree method or partial cutting is the preferred harvest method adjacent to live water. Adequate protection to the water will be provided through the timber sale contract stipulations. All timber sales will be designed to perpetuate the forest cover and to provide adequate security and thermal cover for wildlife.

There will be a complete engineering analysis for all road grades that exceed 10 percent. Roads will be routed away from areas that are likely to slump or slide (Map A). Cross drain culverts, water bars, or ditches will be installed where needed to prevent erosion or washing away of the road. Road construction will be kept to the

lowest acceptable standard necessary to remove the wood products and provide public safety. All road development will be kept to a minimum. Temporary roads are normally rehabilitated and closed after logging.

Stream crossings will be permitted when necessary, provided that adequate bridges or culverts are used. In some cases, fords may be acceptable if a substantial stream bottom of rock or concrete can be installed. These crossings may be installed on a temporary basis if it is determined to be more environmentally acceptable.

Disposal of logging residue through firewood sales is the preferred method of reducing residue accumulation. Providing an adequate seedbed for seedling establishment and survival may require that the remaining residue be burned.

Timbered areas adjacent to previously harvested areas should not be harvested until adequate regeneration is established.

Normal operating seasons for timber harvest activities are about June 15 to December 1. Harvest activities may be shut down due to wet soil conditions to prevent soil compaction or rutting. Under favorable conditions, winter logging will be allowed with special approval.

Harvesting timber on slopes exceeding 45 percent will be restricted to cable logging, horse logging, or similar methods. Rubber tire or track skidders will not be used.

Clearcuts generally will not be made within a 100-foot buffer strip on each side of a live stream. Selective partial harvest methods are allowed within this strip. The actual width of the strip may change, depending upon the different aspects of the environment, i.e., slope, soil condition, and understory vegetation.

CULTURAL RESOURCES

For most surface-disturbing activities, an inventory to locate cultural resources (including both historic and archaeological sites) will be performed. A qualified, professional archaeologist (with a permit from BLM) will perform an on-the-ground survey. If significant sites are located, the archaeologist will recommend a mitigation strategy. "Significant" sites are those potentially eligible for inclusion in the National Register of Historic Places. Significant archaeological sites are sites that contain information important to history or

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prehistory. This usually takes the form of sites containing intact buried cultural materials or components.

Surveys are conducted for energy-extraction related compliance and for “in-house” and hardship case inventories. The former are generally conducted by contract archaeologists under permit with the BLM while the latter are usually done by BLM archaeologists. When significant sites are found and cannot be avoided by a project, one or more mitigating strategies will be used in order to preserve the important data.

Several strategies are available to offset the potential adverse effect to cultural resources. The preferred method is to avoid the site, preserving it and the data it contains, in situ. When avoidance is not feasible, other strategies that might be considered include: mapping and collecting of surface material; evaluative testing (small-scale excavation) to determine the nature of the subsurface materials; data recovery through mitigative excavation (larger scale); photography, archival or other records research; and analysis and report preparation.

Historic Trails

Because of the abundance of historic travel routes (Map 2) on the public lands and their national significance, the BLM is preparing a comprehensive Historic Trails Management Plan. This plan will outline how most BLM-administered historic trails in the KRA will be managed from a recreational and cultural resource standpoint. Emphasis will be on long-term preservation coupled with increased visitor use and appreciation of the trail system. No surface disturbance will generally be allowed within 1,320 feet of a historic trail depending on topography and existing surface disturbance.

Wyoming State Office Instruction Memorandum No. WY-83-186 outlines the Bureau's current management guidelines concerning historic trails. Points addressed in the guidelines include stressing avoidance of well-preserved trail segments, whenever possible. Projects should not be planned to closely parallel existing historic trails or to cause visual intrusions in areas where the natural setting has changed little since the time of major emigrant travel. A three-part criteria system for evaluating the significance and National Register eligibility of a given trail segment is also included. The three elements relating to trail significance are: intact physical remains (e.g., trail ruts,

campsites); integrity of natural setting; and good historical association (presence of archival verification of location of trails or other historic sites such as stage stations, graves, etc.). These guidelines, and others in preparation, will address the Bureau's current historic trail management goals and will be included in the Historic Trail Management Plan.

FIRE MANAGEMENT

Fire management actions are analyzed under the alternatives.

EXISTING MANAGEMENT

This alternative considers the continuation of current management direction. It would continue present management practices and levels of resource use. This alternative would reflect only the changes necessary to respond to the requirements of new regulations and changing national policies. This would be the “No Action” alternative.

AIR QUALITY (Issue 2)

The most controversial industrial emissions being released into the atmosphere in the KRA are a result of oil and gas development. Many wells in the KRA contain hydrogen sulfide (H_2S), which is a poisonous substance. These H_2S rich wells are developed under existing management with concern for the health and safety of the public and other resource impacts which may result from accidental sour gas (H_2S containing) release while also stressing the most economical recovery of the minerals involved. During the drilling of wells with potential to contain H_2S , operators are routinely required to conduct a H_2S release contingency program. This program is designed to protect workers at the well site and provide for the safe evacuation of members of the public who might become exposed to H_2S in the event of a release. Emissions from proposed sweetening plants are projected by BLM, to assess if the emissions will adversely impact the surrounding environment. Routine management practice in the KRA is to evaluate these projected emissions against State and Federal standards and impacts to resources before final BLM grants of right-of-way, leases, or other approvals are given to applicants. Other

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mineral development activities and industrial project applications (i.e., coal fired power plants) are handled in the same manner.

In general, the KRA manages air quality to protect and enhance the resource through careful planning and coordination of its allocation with the State of Wyoming. Under existing management, few stipulations directly relating to air resource management are incorporated into Bureau leases or rights-of-way; most specific stipulations are deferred to the State of Wyoming issued air pollutant emissions permit.

GEOLOGY AND MINERALS

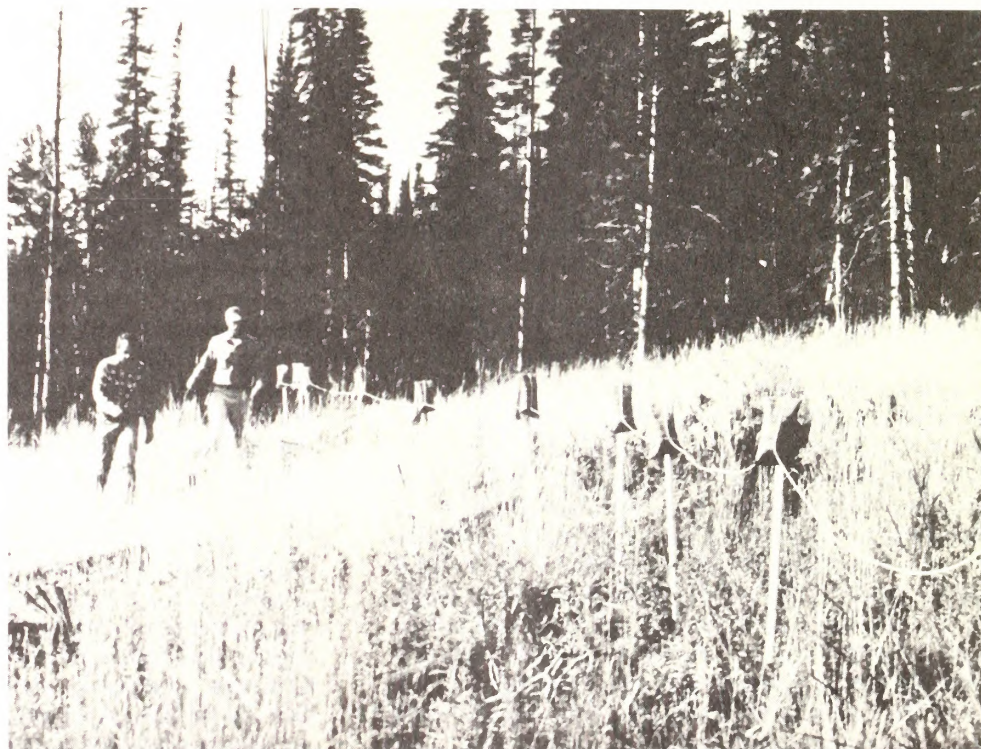
Geophysical Exploration (Issue 1)

One of the primary tools used in the search for oil and gas is geophysical exploration. This involves observing seismic, electrical, gravitational, magnetic, or thermal properties of the earth. Seismic properties, where geophysical crews send energy into the earth, are examined the most. The resulting seismic waves are recorded by sensitive instruments and recorders. The waves generated are similar to those

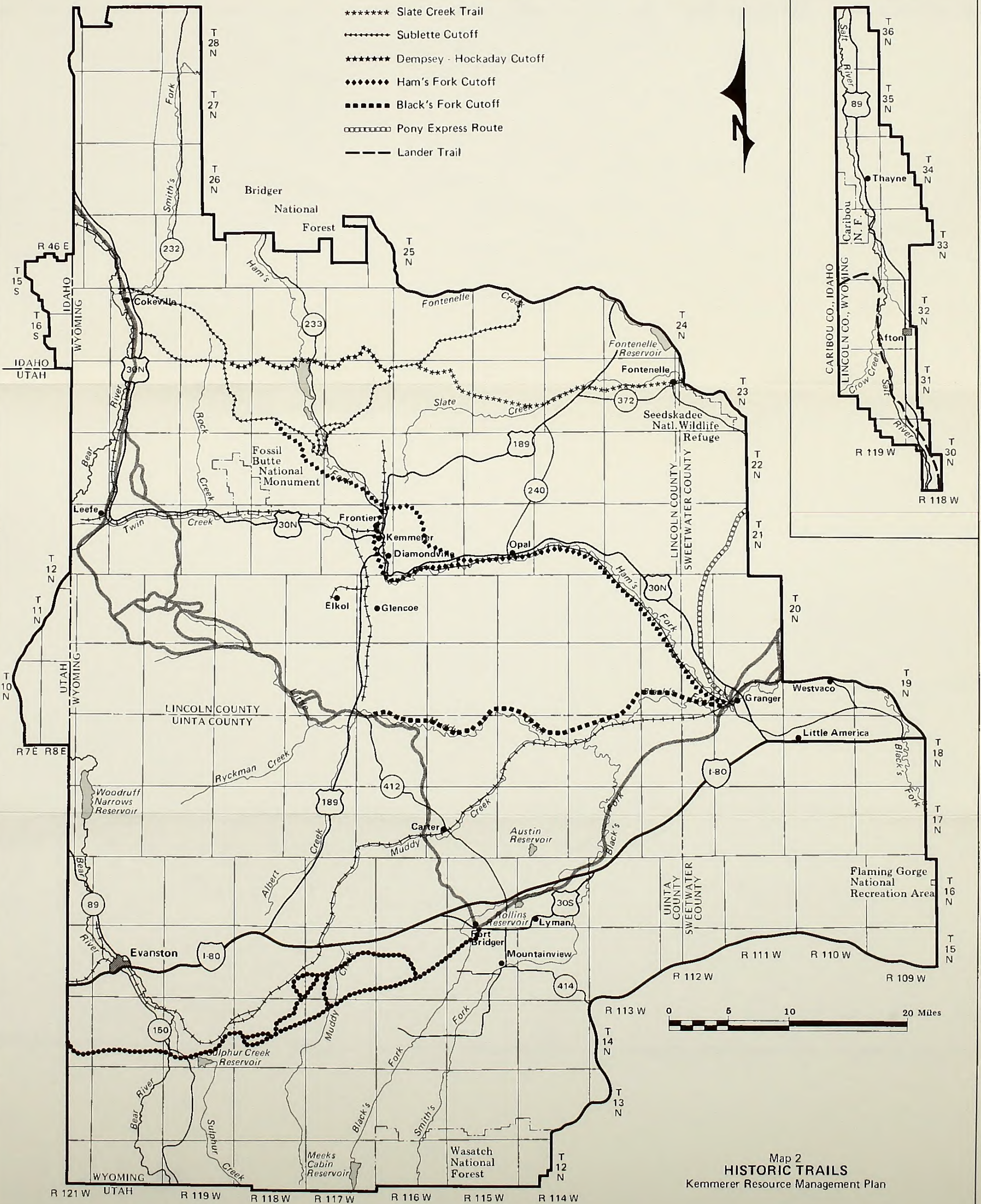
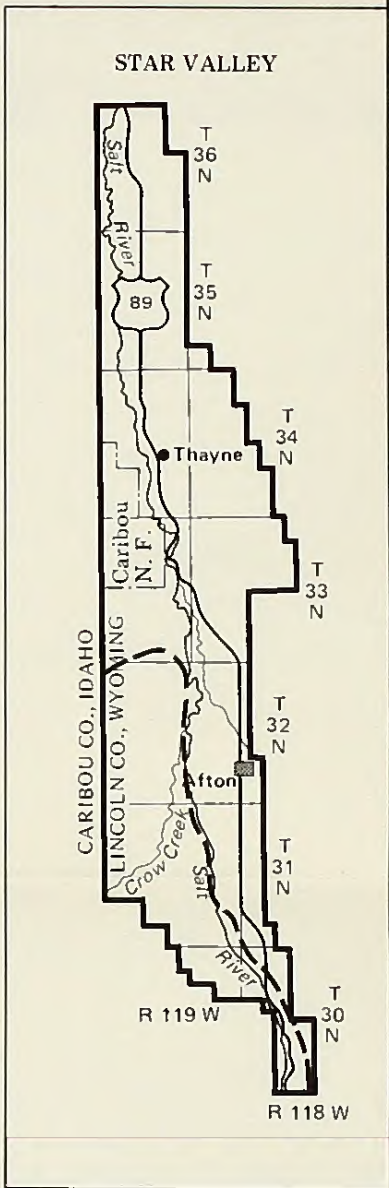
generated by an earthquake, but on a much smaller scale. Interpretation of the readings can give the geophysicist an idea of the nature of subsurface geologic formations, and thus an idea of the oil and gas potential.

The energy is introduced into the ground using several methods. The drilling method utilizes truck-mounted drills which drill small-diameter holes to depths of 100 to 200 feet. Usually, a 50-pound charge of explosives is placed in the hole, covered, and detonated. The detonated explosives send energy waves below the earth's surface which are reflected back to the surface from various subsurface rock layers. The holes are drilled in a linear fashion, forming a line that can be many miles in length. In rugged topography, a portable drill is sometimes carried in by helicopter. Charges are placed in the hole as in a truck-mounted operation. Another portable technique is to carry the charges in a helicopter and place the charges on wooden sticks, or lath, three feet or so above the ground. Charges used are either 2-½ or 5 pounds. Usually, 10 charges in a line on the ground are detonated at once. The other major technique used in the KRA for seismic investigation involves truck-mounted vibrators, which shake the ground to send energy into the earth. No explosives are used in this technique.

Layout of portable seismic charges for oil and gas exploration

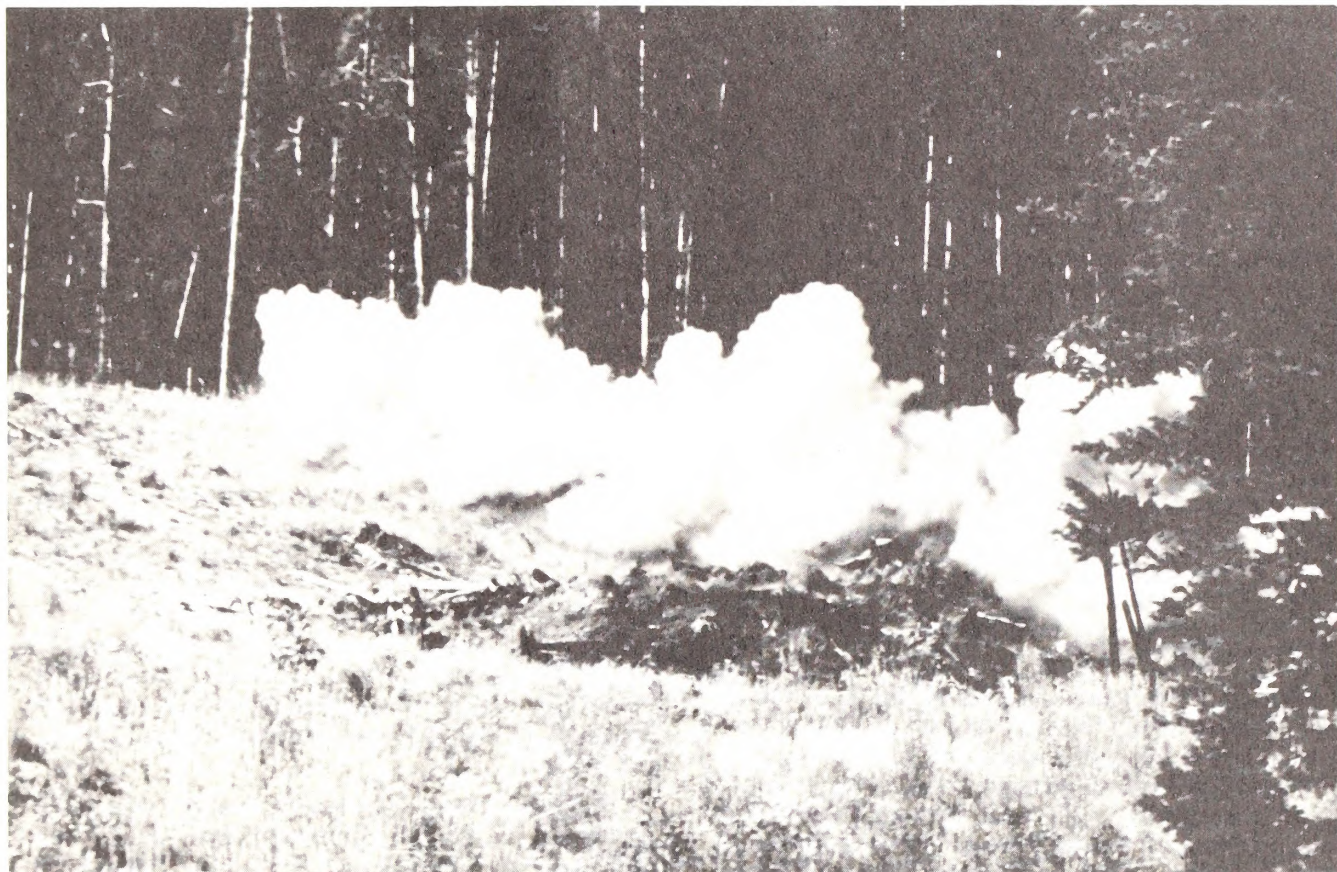


- Oregon Trail
- Mormon - California Trail
- ***** Slate Creek Trail
- Sublette Cutoff
- ***** Dempsey - Hockaday Cutoff
- Ham's Fork Cutoff
- Black's Fork Cutoff
- Pony Express Route
- Lander Trail



Map 2
HISTORIC TRAILS
 Kemmerer Resource Management Plan

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Detonation of portable seismic line

In all cases described above (where BLM administers the surface), the BLM receives a Notice of Intent from the company with a map depicting the locations of the proposed seismic lines. The BLM and geophysical operators have agreed on standard stipulations to protect resources impacted by the seismic lines. A Notice of Intent is not a permit; the Bureau may apply restrictions on the lines, but does not have the option of denying the activity. Existing Management for geophysical exploration is described below.

Big Game Winter Range

Crucial big game winter range for elk, deer, antelope, and moose occurs over large parts of the KRA (Map B). During the crucial period of October 15 to May 15, seismic lines are allowed into those areas on a case-by-case basis, after checking the status of wildlife in the vicinity of the line. Aircraft and ground surveys would be used to check the wildlife status.

Bald Eagle Roosting

Eagle roosting areas are shown on Map B. Seismic lines are reviewed on a case-by-case basis and seasonal winter restrictions (10/15-5/15) applied to alleviate impacts to roosting areas.

Raptor Nests

Raptor nests are scattered in various locations in the Overthrust Belt (Map B). Proposed seismic lines are re-routed as much as possible to divert them away from the nest sites. Seasonal restrictions may be applied to avoid nesting dates.

Elk Calving

Elk calving areas (Map B) are closed during late spring and early summer (May 15 to June 30). Exceptions are granted on a case-by-case basis. Seismic lines proposed in those areas during the crucial period are reviewed for impacts to elk calving habitat and usually restricted during the crucial period. Flights or ground surveys are used to check on the elk's status in some cases. Seismic lines are allowed if the area is not being used.

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Sage Grouse

No seismic activity is permitted within two miles of the center of a sage grouse strutting ground (Map B) from March 1 to June 15, unless a field check of the strutting ground shows no activity. Depending on the type of seismic operation involved, the seismic line may be allowed into the strutting ground during certain hours of the day when the birds are inactive.

Domestic Sheep Lambing

Lambing areas on (Map 3) are critical during May, although not all of the lambing area is used at one time. The entire lambing area is closed to seismic lines during May, and from June 1 to June 20 the seismic operator must contact the permittee before entering the area.

Hunting Areas

Geophysical (seismic) lines would continue to be excluded from the area shown on Map 4 due to the heavy use by hunters during the deer and elk seasons (which currently runs from October 1 to October 31). The hunting area closure for geophysical is an area which is west of Slate Creek Ridge, west to the Wyoming-Utah and Wyoming-Idaho State lines, and north from the edge of the checkerboard land pattern to the Forest Service boundary and Salt Creek Canyon.

Muddy Areas

One of the standard stipulations states "The operator shall avoid any operations when the ground is muddy or wet. The Area Manager may prohibit exploration, drilling, or other activities during wet or heavy snow periods." The operator is expected to recognize and avoid muddy conditions.

Riparian Areas

There would continue to be no restrictions placed on minimum distances from perennial creeks (live water) for surface disturbing operations. There would continue to be no restrictions placed on where and how to cross riparian areas. Reclamation of disturbed riparian areas are handled in the same manner as for upland sites.

Exclosures

No restrictions around fenced range or wildlife exclosures.

Threatened and Endangered and Sensitive Plants

Geophysical lines would continue to be routed away from threatened, endangered, and sensitive plant areas.

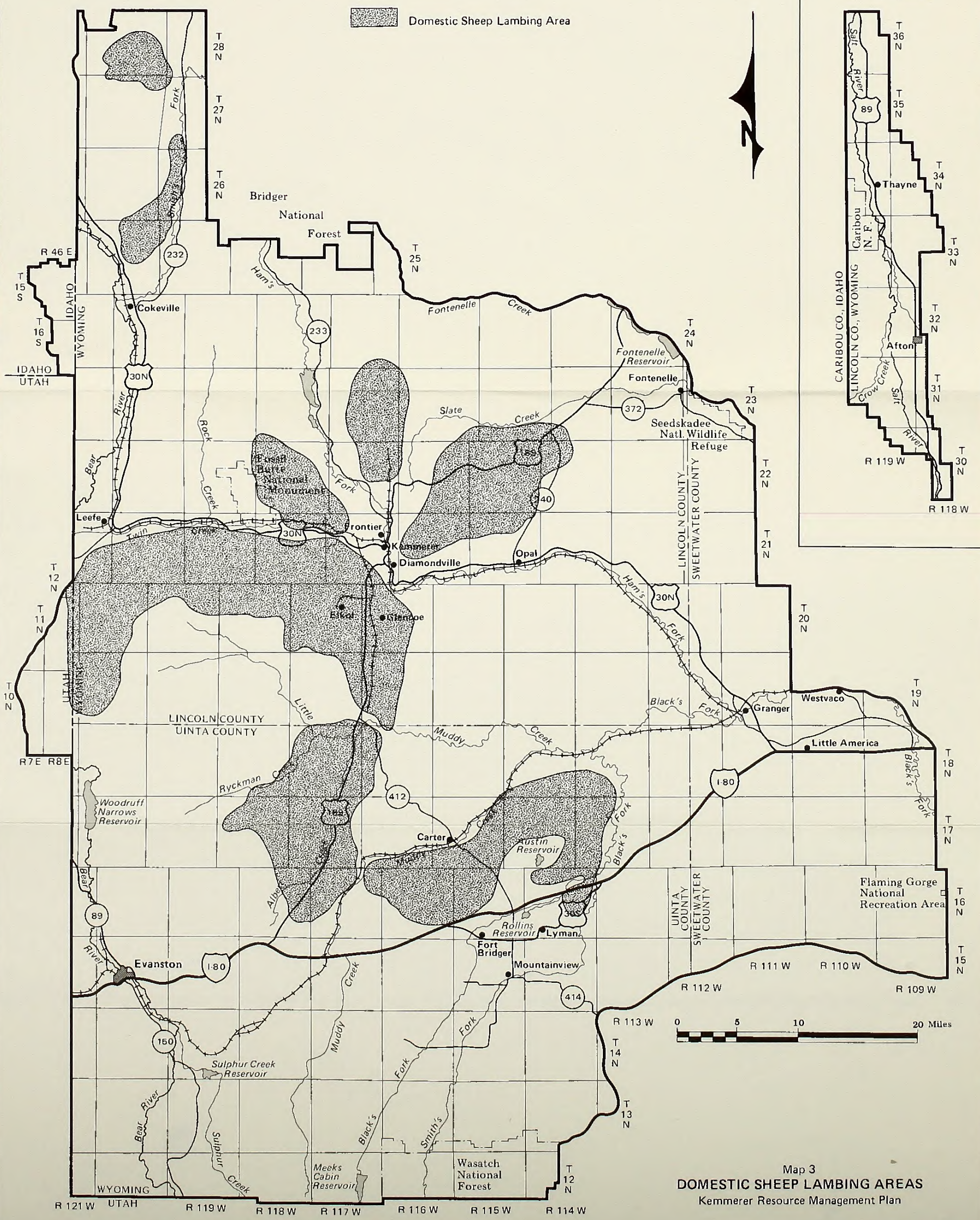
Oil and Gas (Issue 2)

The public may request that KGS land be offered for competitive leasing. The BLM would prepare a report on KGS status, recommend whether competitive leasing would be in the public interest, and nominate tracts to be grouped in lease parcels. If leasing would be recommended, land nominated by the public would be combined with BLM nominations (in active KGS areas), the BLM Area Office would be consulted concerning conflicts with land-use planning, and a competitive lease sale would be scheduled. Competitive leases are issued for five years.

For noncompetitive leases, action would be initiated when an applicant applies for an unleased parcel in a non-KGS area. If the land is available, the BLM Area Office would respond with any recommendations; and upon approval, the lease would be issued to the applicant without competition or drawing.

In "simultaneous filing", previously-leased parcels in non-KGS areas are placed on a list as they become available following termination of the old leases. The BLM Area Office would make recommendations on land-use suitability. Once a list would be approved and advertised, all applications received during the filing period would be considered to have been filed simultaneously. An applicant may file only one application per tract. A lottery-type drawing would be held and one application is drawn for each tract. Noncompetitive leases would be issued for 10 years.

As oil and gas leases expire and are re-offered through the simultaneous leasing system, or offers are made to lease either competitively or noncompetitively, BLM would add stipulations from a list of standard stipulations (Appendix B-1). The blanks in the stipulations would be filled in with the following information, as circumstances warrant:

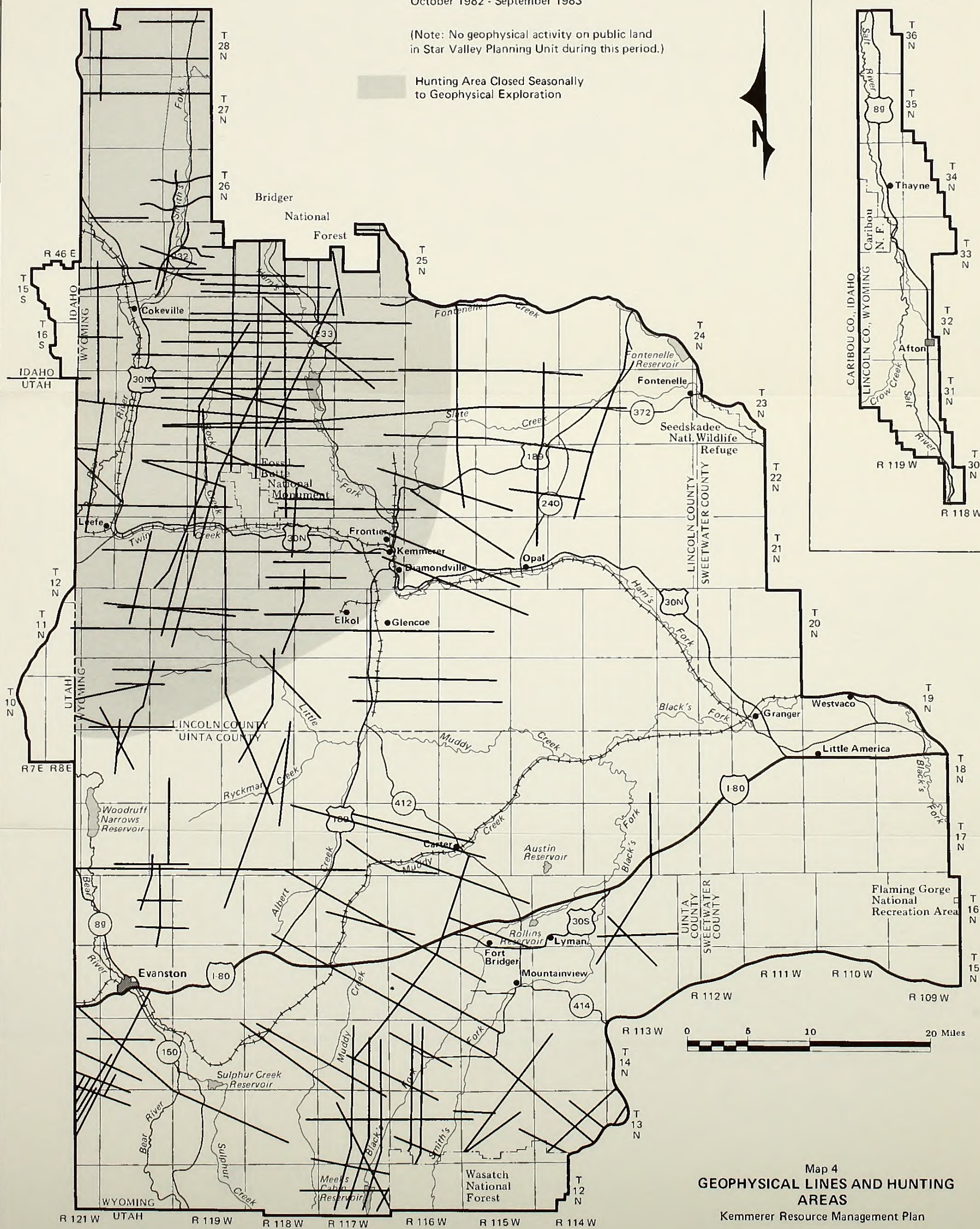


Map 3
DOMESTIC SHEEP LAMBING AREAS
Kemmerer Resource Management Plan

Geophysical Lines —
October 1982 - September 1983

(Note: No geophysical activity on public land in Star Valley Planning Unit during this period.)

Hunting Area Closed Seasonally
to Geophysical Exploration



Map 4
GEOPHYSICAL LINES AND HUNTING
AREAS
Kemmerer Resource Management Plan

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Distances: ¼-mile from historic trails; 500 feet from live water.

Slopes: no restrictions, deferred to APD stage.

Dates: crucial big game winter range - activity allowed from May 15 to October 15; sage grouse wintering complex - activity allowed from March 1 to October 1; elk calving areas - activity allowed from May 30 to April 15.

The following restriction currently applies to all oil and gas associated activities within sage grouse strutting and nesting areas:

“No occupancy or other surface disturbance will be allowed within a 1,320-foot radius of the center of a sage grouse strutting ground (lek). No exceptions to this will be granted. Exploration, drilling, and other development activity will be allowed only from June 15 to March 1 to protect the nesting area around the strutting ground. Exceptions to the monthly limitations in any year may be specifically authorized in writing by the District Manager, Bureau of Land Management.”

Although in some cases parts of the lease may contain some no surface occupancy areas (such as near live water), the no surface occupancy provision is almost never applied to the entire lease. There would continue to be no areas of “no leasing”, except in the Raymond Mountain Wilderness Study Area (WSA), where leases are not being renewed due to a Secretarial decision and language in appropriation acts.

Access roads are often needed in support of APDs. Several roads in the Raymond Mountain WSA are designated as “closed.” The rest of the KRA would continue to remain open to new road construction, with site-specific stipulations added at the time of approval.

There would continue to be no restrictions on development in landslide prone areas.

The current requirements for protection from the effects of H₂S gas are associated with safety plans for individual well sites. There would continue to be no H₂S requirements associated with overall field development.

SOILS

Present management of the soil resource involves evaluation and interpretation of soils

within project boundaries to assist reclamation efforts (i.e., determination of topsoil depth) and to minimize erosion and sedimentation. To date, over 230,000 acres of soil have been surveyed by the BLM (Order III intensity) in the KRA.

Reclamation (Issue 3)

Past and existing problems associated with reclamation include: lack of, or improper water control leading to severe erosion; excessive removal of re-established vegetation, principally by cattle; improper site preparation prior to seeding; lack of topsoil over the entire disturbance. There are no development slope restrictions (revegetation potential), reclamation timeframes, or offsite mitigation for surface disturbances.

Authorized surface disturbance activities consist mainly of road rights-of-way (both temporary and permanent), power and communication lines, pipeline installation, oil and gas well construction, and plant site development.

The least amount of disturbance results from power and communication lines, which usually require only water barring and seeding. On pipelines and road rights-of-way, topsoil is stripped and stockpiled until construction is complete. Temporary roads and pipeline routes are reshaped and recontoured to the surrounding terrain, surfaced with topsoil, water barred, and seeded on the contour (drilled or broadcast, depending on slope and surface rock content). Seeding mixtures promote native community types. The unused portions of permanent roads are covered with topsoil and seeded on the contour after construction.

On the much larger oil and gas well pad disturbances, an application is filed to construct the pad as well as to drill. The application consists of three portions: the application or APD, the drilling plan, and the Surface Use Plan. A complete application covers all aspects of surface, subsurface, and reclamation activities and can be rejected if any portion is not adequately addressed. Reclamation is covered under the Surface Use Plan. Each point in the surface use plan must contain enough detail to give the reader a clear, concise overview of the proposed action. Topsoil depth and stockpile location would be determined by the BLM.

After the well pad or plant site has been abandoned and the reserve pit fluids or detention ponds have evaporated, the following procedures are followed:

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1. All disturbed areas will be resurfaced with topsoil to a uniform depth upon completion of recontouring or reshaping of the subsoil.
2. All disturbance will be seeded with 12 to 15 pounds per acre of pure live seed (native species, where possible). Seed would be drilled on the contour. Exceptions include slopes too steep or rocky for seed drilling equipment. In these areas seed will be broadcast and seeding rates would be doubled.
3. Disturbed areas that are recontoured would have erosion control measures applied (i.e., fiber mats), where necessary.
4. Fencing of reclaimed areas will be required when dense population of livestock or wildlife are present.

Producing well locations would be reduced to a minimum of 3:1 slope, contoured, and resurfaced with topsoil. The site would be stabilized by implementing appropriate erosion control measures. Native or non-native (if needed) 90 percent pure live seed would be drilled or broadcast (depending on surface rock content and terrain).

LIVESTOCK MANAGEMENT (Issue 4)

Grazing Preference

Livestock grazing would continue at the current authorized level. Presently, active grazing preference amounts to approximately 162,000 AUMs of public land forage licensed to livestock operators throughout the KRA.

Allotment Management Plans

There would be no new AMPs developed for any allotments. Those AMPs currently in force would continue to be followed. Those allotments with AMPs are Willow Creek, Bench, Poison Creek, and Beaver Creek. The Rock Creek allotment AMP is not yet fully implemented, and would be completely implemented within 10 years.

Range Improvements

New range improvement projects would be limited to the kinds and numbers necessary to complete the implementation of the Rock Creek Allotment Management Plan and other proposed

projects (see Appendix A-2 for projected types and numbers of range improvements). Maintenance and reconstruction of existing range improvements would be completed on a case-by-case basis as needed, and in accordance with the current BLM Range Improvement Policy (Appendix A-3).

An economic analysis was performed to determine the cost effectiveness of the proposed range improvement investments for each alternative. This analysis compares the discounted costs of the alternative with the discounted benefits. A benefit to cost ratio and a present net value are also calculated. Under Existing Management, the economic analysis of the proposed range improvements resulted in a benefit to cost ratio of 1.01 and a present net value of \$1,826.

Forage Increases

All future long-term increases in forage would be allocated to satisfy the Wyoming Game and Fish Department's strategic plan for wildlife numbers, as well as to meet the objectives for livestock grazing and other resources on a relative priority basis. Priority for allocation would be developed by allotments.

Combining Allotments

No allotments would be combined or split under this alternative. Existing allotments are shown on Map C.

Rangeland Monitoring and Evaluation

A total of 10 allotments (five AMPs) are currently monitored for trend, utilization, climate and actual use. Trend data are also collected on four additional allotments. Ecological range site condition mapping would be completed on selected "I" category allotments as well as some solid blocked lands. Appendix A-4 describes the rangeland monitoring plan for the KRA.

Vegetation Manipulation

Vegetation manipulation is currently accomplished through mechanical, chemical, or prescribed fire techniques. Approximately 5,000 acres are proposed to complete existing AMPs.

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Interagency Cooperative Management Plans

There are currently no cooperative plans with the Forest Service in effect. None are proposed under this alternative.

Non-Alloted Public Lands

Approximately 4,500 acres are presently unallotted within the KRA. These acres account for approximately 646 unlicensed AUMs. These AUMs would remain unlicensed under this alternative.

Conversions in Kind

Conversions in kind of livestock would be allowed only after a study of suitability for conversion and accompanying EA have been prepared.

Riparian

No special considerations would be given to riparian areas except for existing AMPs. Riparian areas could receive continuous grazing during the season of use.

Allotment Categorization

During fiscal year 1981, the Bureau began a review of its grazing management program with the objective of making its efforts more efficient and cost effective. To this end, a system was developed and promulgated through the Final Grazing Management Policy to assign management priorities among allotments. This system, called selective management, is based on the reasoning that:

1. Allotments can be grouped into management categories based on shared similarities in economic potential, actual or potential resource conflicts, management needs, and estimated potential for increased forage production.
2. Allotments can be grouped in terms of the management intensity required to meet multiple-use objectives established through Land Use Planning.
3. Allotments can be grouped to establish priorities for the investment of public funds and management efforts.

Through selective management, allotments sharing similar characteristics are placed in one

of three categories (in order of priority starting with the highest): "I" (improve), where objectives are directed towards improving current resource conditions; "M" (maintain), where the objective is to maintain current satisfactory resource conditions; or "C" (custodial), where the objective is to prevent further deterioration of resource condition. Allotments may change categories upon resolution of resource problems.

Criteria have been developed to assist in placing KRA allotments into these specific categories. Appendix A-5 describes the criteria and lists the KRA allotments by category. Appendix A-6 lists some potential management opportunities for each "I" category allotment.

Cooperative Management Agreements

CMAs may be authorized on selected allotments, depending on current policy guidance. The purpose of the CMA program is to provide the livestock operator who has demonstrated exemplary management practices an opportunity to assume a larger role in the management of public lands. The CMA is a written agreement between BLM and the livestock operator that bestows upon that individual the responsibility to manage livestock on an allotment in a manner that would achieve the multiple use objectives identified for the allotment. The BLM would be encouraging these operators to maintain high standards for their management practices while also reducing Federal costs of improving and managing the public lands. Potential participants in this program would be identified through nomination by any person or group but are usually nominated by local interest groups such as the District Grazing Advisory Board, the Multiple Use Advisory Council, the Soil Conservation District, etc. Nominees would be screened by BLM to determine eligibility for agreements. Agreements would be negotiated only on those allotments where a livestock operator has proven himself as a responsible land steward. The agreement would specify the terms, conditions, and objectives to which the operator would be bound. Upon completion, the agreements would be presented to the District Grazing Advisory Board for recommendation on approval. Completed agreements would have a tenure of ten years with formal review due after five years. If the objectives for the allotment are being met, a new ten year permit may be issued. If not, the operator would be allowed time to make adjustments. If,

ALTERNATIVES

at any time, the operator is found to be in violation of the terms and conditions of the CMA, the agreement may be cancelled.

FISH AND WILDLIFE HABITAT (Issue 5)

Consideration of riparian areas in management actions varies among programs. The wildlife program has taken some positive steps to improve riparian habitat for the Bonneville cutthroat trout in the Thomas Fork HMP area (see Management Common to All Alternatives). However, most management of riparian zones is directed towards minimizing impacts from other resource use. Conditions and mitigation are applied to most development activities that may impact riparian habitat. Its main goals are to reduce stream sedimentation and minimize loss of riparian vegetation. Although grazing systems have been implemented on several allotments with existing AMPs, continuous grazing during season of use is practiced on most allotments. Current management generally accommodates the user's preference for kind of livestock to be grazed with impacts to riparian areas receiving minimal consideration.

The Raymond Mountain ACEC was designated in 1983 and incorporated much of the Thomas Fork HMP area. The objectives of the ACEC are to protect important fisheries and big game winter range, and to perpetuate the scenic nature of the area. The ACEC presently forms part of the Raymond Mountain Wilderness Study Area (WSA). The WSA was not recommended to receive Wilderness Area status.

Two new HMPs are planned. The Woodruff Narrows HMP is planned for completion during fiscal year 1985. It will be a cooperative effort among BLM, WGFD, USFWS, and Bingham Engineering Company. The primary objectives will be to maintain or improve riparian habitat used for roosting by wintering bald eagles and to mitigate possible habitat loss from the construction of a low head hydropower plant proposed by Bingham Engineering Company. The proposed Overthrust HMP would address impacts to important wildlife habitat from energy development and associated activities within the Overthrust Belt, which includes approximately one-half of the KRA. The general objectives would be to enhance big game winter range and mitigate habitat loss from energy development. Specific objectives will be determined following completion of baseline studies by the Cooperative Wildlife Program presently being funded by the Overthrust Industrial Association.

Oil and gas development occurs throughout the KRA with major discoveries in the Overthrust and Moxa Arch structures. Within the Overthrust Belt, intensively developed fields exist along the southern Bear River Divide and south of Evanston, which are primarily mule deer summer range. Extensive geophysical exploration is prevalent in mule deer and elk winter ranges to the north of existing oil and gas fields and several wildcat wells have been drilled. Actions to mitigate wildlife habitat loss have been confined to seasonal closures for construction activities and to conduct geophysical exploration. These minimize the disturbance to animals during crucial periods (see Issues 1 and 2).

Big game winter ranges are currently open for snowmobile use during winter. During the 1983-84 winter, the WGFD identified problems with snowmobile disturbance to elk wintering in the Rock Creek and Slate Creek winter ranges. The Pine Creek road is currently the major access route to Dempsey Ridge from the Cokeville area. The poor quality and location of this road has caused erosion problems. In addition, numerous "2-track" trails have been developed north of the Pine Creek road into crucial elk calving areas along Dempsey Ridge.

Equipment crossings on perennial streams would be allowed only at constructed areas. Bridges and culverts crossing perennial drainages would have to be designed to allow fish passage.

RECREATION (Issue 6)

Recreation Potential

Potential recreation sites and areas (Appendix H) are acknowledged and recognized, however, BLM developments are nonexistent and not anticipated for the near future. Areas of high recreation potential (Map 5) include Commissary Ridge, Dempsey Ridge, Raymond Mountain, Pine Creek, Upper Smith's Fork, Upper Hams Fork and Meeks Cabin.

ORVs

Most of the KRA (1,600,064 acres) is open and unrestricted to ORV use, except for ORV closures in the Raymond Mountain area (Raymond Canyon, White Canyon, and the two ways leading down to Raymond Canyon from the IGO Speedway). Closures cover 32,936 acres.

ALTERNATIVES

Raymond Mountain WSA

The Raymond Mountain WSA (32,936 acres) is presently managed under the guidelines of interim management for wilderness. This management will persist until Congress decides the WSA is either suitable or non-suitable for wilderness. A 13,530 acre wildlife ACEC is located in the WSA. The ACEC is managed primarily to protect the sensitive Bonneville cutthroat trout and its habitat and crucial big game winter range for elk and deer. Recreation values are also considered.

Raymond Canyon is barricaded to prevent four-wheel vehicles from using the canyon trail. The two ways leading into the canyon from the IGO Speedway are signed to prohibit ORV use. Canyon bottoms are heavily utilized by livestock during the fall (Map 6).

LAND RESOURCES

Land Tenure Adjustment (Issue 7)

The methods of land tenure adjustment are the same as discussed in the Management Common to All Alternatives. The scattered isolated parcels of public land in the Star Valley area have been identified for disposal in the Star Valley MFP.

During the summer of 1983, the KRA held two public meetings to secure public input on completing disposal or transfer public lands in Star Valley to non-Federal ownership. Based upon public input and information provided to the BLM, two R&PP applications have been filed and are being processed. One application is from the Town of Afton for a recreation area. The Wyoming Game and Fish Commission filed an application for an elk feeding ground and wintering area. The KRA is negotiating a memorandum of understanding with the Forest Service, proposing to transfer management of public lands adjacent to the Bridger-Teton or Caribou National forest boundaries to the Forest Service.

Other lands in Star Valley (Map 7), if found suitable, will be disposed of by sale or exchange. As described under Management Common to All Alternatives, site specific compliance with NEPA and publication of a NORA would occur. The most likely means of disposal are also indicated on Map 7.

Lands in the remainder of the KRA are currently considered for sale on a case-by-case

basis. Generally, a member of the public, local government, or a corporation identifies a parcel for sale. The KRA then conducts a review of the FLPMA criteria and a review of the existing Pioneer Trails MFP to see if the parcels are identified. An EA/Land Report is then prepared and a NORA is published. The KRA has used these procedures for the past two years to sell approximately 680 acres.

In 1982, the KRA identified approximately 53,467.74 acres of public land (Appendix D) that appear to meet FLPMA sale criteria. Sale of these lands will be based upon public demand and will occur as budget restrictions allow. Under present funding, it is anticipated that no more than 500 acres per year can be sold.

Other land tenure adjustment actions, such as exchanges and R&PP lease or patent actions occur on an as requested basis. Because the Bureau's current emphasis is on processing "Good Neighbor" R&PP cases, it is anticipated that the KRA will process two or three leases each year.

At present, no exchange proposal have been filed in the KRA. The requirement that an exchange must be in the best interest of the public may preclude accomplishment of an exchange if a proposal were filed.

Rights-of-Way (Issue 8)

Rights-of-way will continue to be processed under the authorities and policies described in Management Common to All Alternatives. The KRA is presently including season of use stipulations in rights-of-way where it has been determined that the proposed right-of-way use would disturb crucial wildlife habitat in an area (Map B).

Examples of season of use stipulations are:

- Crucial Winter Range - no disturbance from October 15 to May 15
- Sage Grouse Strutting/Nesting Areas - no disturbance from March 1 to June 15
- Elk Calving Areas - no disturbance from May 15 to June 30
- Domestic Sheep Lambing Areas - no disturbance from May 1 to May 31

Exceptions to these stipulations can be granted by the Area Manager after consulting with the appropriate staff member.

There are no year-round avoidance areas except the Raymond Mountain WSA. If impacts by a project do not impair the wilderness values

ALTERNATIVES

of the area, an project may be constructed. Specific criteria are contained in the Wilderness Interim Management Plan located in the KRA office.

Communication site rights-of-way are granted after the BLM completes an environmental analysis and receives a copy of the applicant's Federal Communication Commission license. Because of possible radio interference, the existing users are provided copies of the new applicant's operating frequencies. The KRA encourages new users to utilize existing buildings, however, if they wish to construct a new building, it is generally allowed. Appropriate stipulations are used to reduce visual impacts and surface disturbance. Most of the existing communication sites in the KRA are becoming crowded.

Access (Issue 9)

The acquisition of public access across private lands by the BLM is presently handled on an as needed basis in support of any of the other resource management programs. The BLM has an existing public road system map. This system reflects the county road systems and BLM roads.

When the KRA reviews an application for a road right-of-way filed by an oil and gas company for access to a proposed well location, the right-of-way generally requires that in the event that the well is a non-producer, they must restore the road to natural conditions. Under current policy, if a landowner requests or if the BLM feels it is necessary to maintain better access into an area, the BLM waives the restoration of the road to allow the public access to the public lands.

FIRE MANAGEMENT

The KRA has averaged ten wildfires per year, ranging in size from 0.1 to 15,000 acres for the past ten years. Typical wildfire suppression has been in the form of initial attack with less than 10 percent of the wildfires needing additional support.

Vegetation communities affected have been primarily of the sagebrush/grass types with an occasional occurrence in the conifer type. In most cases natural boundaries or lack of fuel have been the determining factors for size of areas burned, while wind speed would determine intensity and rate of spread. Wildfire rehabilitation has not been necessary within these communities.

Current policy directs a full suppression effort be made in lieu of no fire management plan development.

ALTERNATIVE A

This alternative emphasizes a reduction in the restrictions on oil and gas exploration and development. Stipulations on where and when oil and gas related activities could take place would be limited, thereby facilitating development of the resource. Other management actions would be consistent with this objective.

AIR QUALITY (Issue 2)

Similar to Existing Management. Since reduced restrictions on oil and gas development would occur under this alternative, BLM might encounter an increased air resource workload in the reviewing of emissions permits for sweetening plants or preparing analyses for their placement, and reviewing or preparing risk analyses for sour gas pipelines and the like. Reduced restrictions under this alternative would not necessarily result in more construction of sweetening plants or pipelines than are planned; market and other resource considerations will play a major role.

GEOLOGY AND MINERALS

Geophysical Exploration (Issue 1)

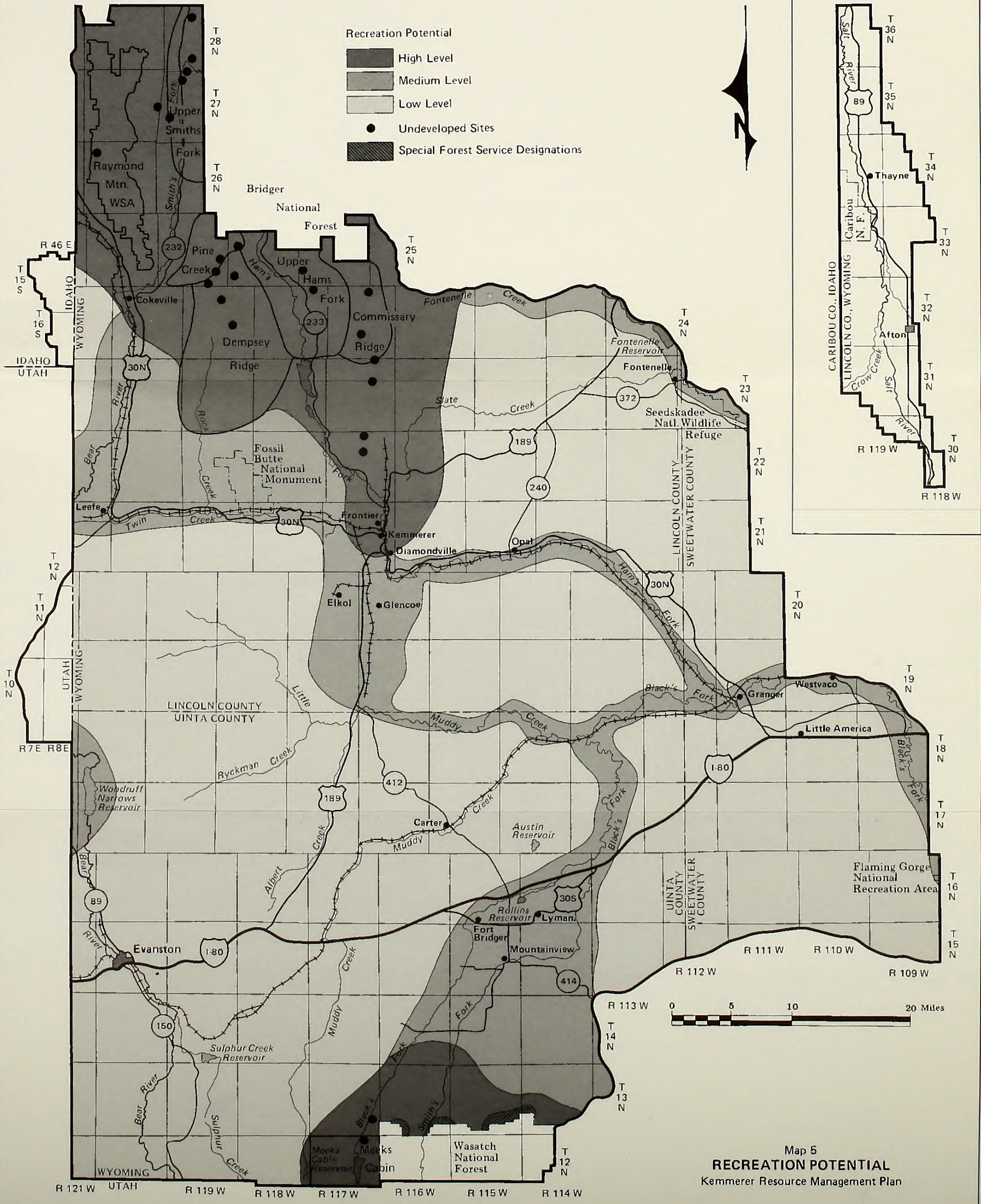
The following would be treated the same as Existing Management: bald eagle roosting; muddy areas; riparian areas; exclosures; and threatened, endangered, and sensitive plants.

Big Game Winter Range

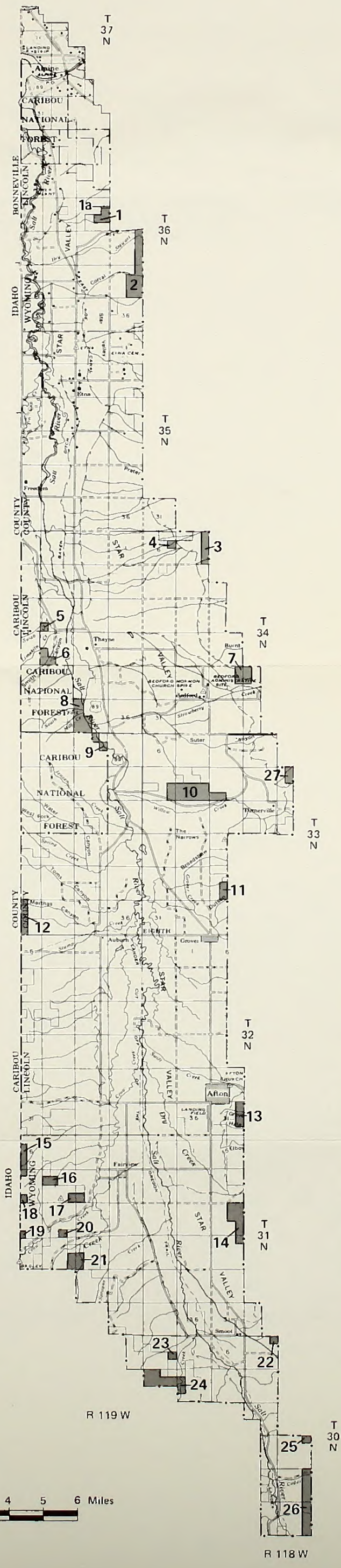
Under this alternative, seismic lines would be allowed into critical big game winter ranges year round.


Raptor Nests

There would be no buffer zones around the raptor nests, but seismic lines would have to comply with the Federal Migratory Treaty Act (no destruction of nest).



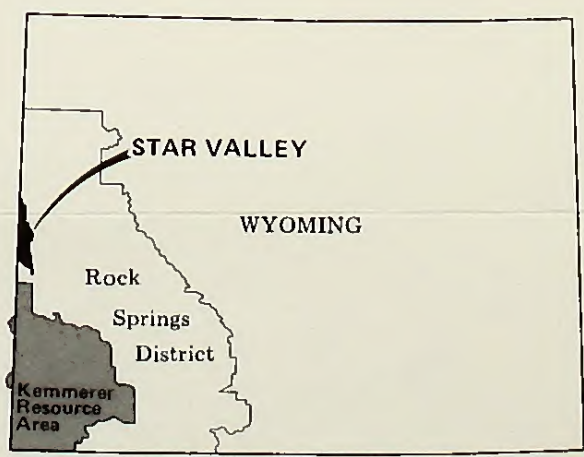
Map 5
RECREATION POTENTIAL
Kemmerer Resource Management Plan



 BLM Lands Considered in Star Valley Disposition

Existing and Preferred Alternatives

- 1 R & PP - Transfer - Bridger-Teton USFS
- 1a Transfer - Bridger-Teton USFS
- 2 Transfer - Bridger-Teton USFS
- 3 Transfer - Bridger-Teton USFS
- 4 Consider For Sale
- 5 Consider For Sale
- 6 Transfer - Caribou USFS
- 7 Transfer - Bridger-Teton USFS
- 8 Transfer - Caribou USFS
- 9 Transfer - Caribou USFS
- 10 Consider For Sale
- 11 Transfer - Bridger-Teton USFS
- 12 MOU - Idaho BLM
- 13 R & PP - Town of Afton
- 14 Transfer - Bridger-Teton USFS
- 15 Consider For Sale
- 16 Consider For Sale
- 17 Consider For Sale
- 18 Consider For Sale
- 19 MOU - Idaho BLM
- 20 Consider For Sale
- 21 Transfer - Bridger-Teton USFS
- 22 Transfer - Bridger-Teton USFS
- 23 Consider For Sale
- 24 Transfer - Bridger-Teton USFS
- 25 Transfer - Bridger-Teton USFS
- 26 Transfer - Bridger-Teton USFS
- 27 Transfer - Bridger-Teton USFS



LOCATER MAP



Map 7
STAR VALLEY
Kemmerer Resource Management Plan

ALTERNATIVES

Elk Calving, Sage Grouse, Domestic Sheep Lambing

No restrictions on seismic lines in elk calving areas, sage grouse strutting grounds, or lambing areas.

Hunting Areas

All parts of the KRA would be open to seismic lines during the hunting season.

Oil and Gas (Issue 2)

Under this alternative, only those lease stipulations required by law would be added to the leases. None of the standard stipulations listed under Existing Management would be used. There would be no restrictions on construction activities in important wildlife habitat and no restrictions in sage grouse areas. The remainder of Alternative A would be the same as Existing Management.

SOILS

Management of the soil resource would continue as in Existing Management, however, high priority would be given to site specific soil inventory, analysis, and interpretation in regard to surface disturbance activities (i.e., roads, oil and gas drill pads, plant sites, etc.). This would facilitate construction and expedite reclamation schedules.

Reclamation (Issue 3)

Disturbances such as pipelines, temporary roads, and power and communication lines would have vegetation and topsoil striped and stockpiled during construction. Upon completion of construction, disturbances would be reshaped, recontoured, surfaced with topsoil, water barred, and seeded on the contour with a site-specific soil stabilizing grass species. Any access roads which are deemed to be non-detrimental to resource management (i.e., no excessive erosion and stabilized) and provide needed access, would not be obliterated. On roads retained for access, unused portions would be covered with topsoil and seeded on the contour with a soil stabilizing grass species. No erosion control measures other than water bars would be installed.

On well pad proposals, a Surface Use Plan would be required. Topsoil depth and stockpile location would be determined by the BLM during proposal review.

After abandonment, all well pad disturbances would be reshaped, recontoured to match surrounding terrain, covered with topsoil, water barred, and seeded with a soil stabilizing grass species. Fencing would not be required but satisfactory reclamation would be expected.

On producing location, slopes on all unused portions of the pad would be reduced to a minimum of 3:1 slopes, recontoured, covered with topsoil, and seeded with a soil stabilizing grass species. The primary concern on these locations would be soil stabilization. Erosion control measures on well pads may include matting and mulching where deemed necessary.

There are no development slope restrictions, reclamation timeframes, or offsite mitigation for surface disturbance.

LIVESTOCK MANAGEMENT (Issue 4)

Grazing Preference

This alternative would emphasize livestock grazing, but at a lower level than Alternative B. The overall objective would be to improve range condition on all "I" category allotments through management actions and prevent a decline in condition on all allotments. This alternative would increase present active preference of 162,000 AUMs by up to 31,901 AUMs to 193,901 AUMs by implementing the actions in Appendix A-2.

Allotment Management Plans

New AMPs would be developed for 18 grazing allotments in approximately the priority order shown in Table 2-2. Existing AMPs would continue to be followed on the Willow Creek, Bench, Poison Creek, Beaver Creek, and Rock Creek allotments until monitoring and evaluation indicate that a management change is needed.

Range Improvements

New range improvements could be authorized on "I", "M", and "C" allotments. Types and numbers of range improvement projects to be implemented on "I" category allotments are summarized in Appendix A-2. Maintenance would be assigned to the benefitting user. This

ALTERNATIVES

Table 2-2
“I” CATEGORY ALLOTMENTS
BY MANAGEMENT PRIORITY

Priority Ranking	Allotment No.	Allotment Name
1	1005	Smith's Fork
2	1206	Cumberland/Uinta
3	1035	Rock Creek
4	1113	Slate Creek
5	1430	Willow Creek
6	1418	Bench
7	1042	Beaver Creek
8	1010	Poison Creek
9	1038	Dempsey Basin
10	1039	Fish Creek
11	1501	Medicine Butte
12	1413	Leavitt Bench
13	1324	Cottonwood Bench
14	1303	Lyman Cattle
15	1437	South Horse Creek
16	1320	Leroy
17	1001	Trespass Creek
18	1002	Inchauspe
19	1441	Lower Cottonwood
20	1040	Pole Creek
21	1003	Hobble Creek
22	1036	Mayfield
23	1048	Quakenasp Canyon
24	1302	Granger Lease
25	1449	Sage Creek
26	1317	Bridger Airport
27	1007	Sawmill Creek
28	1004	Preacher Hollow
29	1301	Cow Hollow
30	1318	Bigelow
31	1442	Crooked Canyon
32	1408	Poverty Flat
33	1304	Coyote Springs
34	1046	Trail Creek
35	1045	Lake Creek
36	1044	Granny Peak
37	1026	Lost Creek
38	1027	Underwood
39	1447	Highway

ALTERNATIVES

alternative has a benefit to cost ratio of 1.65 and a present net value of \$1,030,690.

Forage Increases

Long term increases in forage of 31,901 AUMS would be allocated to satisfy the requirements of the Wyoming Game and Fish Strategic Plan for wildlife numbers, and to livestock and other resource uses to achieve management objectives for each allotment.

Combining Allotments

The Cottonwood Bench and Lyman Cattle Allotments (Map C) as well as the Boyd Hollow and Christy Canyon allotments would be proposed for combination under this alternative.

Rangeland Monitoring and Evaluation

Under this alternative, data from climate, trend, utilization, and actual use studies would be collected on all "I" allotments (high intensity). Actual use, climate, and limited utilization and trend would be collected on "M" allotments (moderate intensity). Allotments in the "C" category would be monitored only for climate and actual use. Utilization may be assessed on selected allotments (low intensity). Ecological site condition mapping would continue on high priority "I" allotments, remaining "I" allotments, solid block lands, and checkerboard lands, in that order.

Vegetation Manipulation

Approximately 82,610 acres of vegetation manipulation are proposed under this alternative. Vegetation manipulation would not be proposed

in big game winter ranges or sage grouse nesting areas unless specific allotment objectives are to be achieved.

Interagency Cooperative Management Plans

Cooperative plans between the BLM and the Forest Service would be developed on the Trespass Creek, Inchauspe, Hobble Creek, and Pole Creek Allotments.

Non-Alloted Public Lands

Approximately 4,500 acres of unallotted public lands supporting 646 AUMs would be licensed under this alternative. Some of these lands may, however, be disposed of by the lands program.

Conversions in Kind

Conversion in kind of livestock would be allowed only after a study of suitability for conversion is completed, and then only at the proper conversion rate. Riparian areas would not be allowed to deteriorate due to conversions in kind of livestock. All conversions would be evaluated through environmental assessment.

Riparian

Grazing management on "I" category allotments would be directed towards maintenance or improvement of current condition on riparian areas.

Allotment Categorization

This process would occur as discussed under Existing Management.



Prescribed burn using
helitorch in mountain
big sagebrush type

ALTERNATIVES

Cooperative Management Agreements

Cooperative management agreements may be developed according to current Bureau direction as discussed under Existing Management.

FISH AND WILDLIFE HABITAT (Issue 5)

Oil and gas activities that impact riparian areas would be restricted only to the degree necessary to maintain habitat in current condition. Proposed well locations could still be moved to minimize riparian impacts; however, minimizing development costs would be a major goal under this alternative (see Minerals and Soils). Only T&E species would be protected as required by laws. The sage grouse restriction would be eliminated to reduce the restrictions on energy development.

Logging activities would not be restricted near riparian areas except for required crossings on major perennial streams. Clearcutting could occur adjacent to riparian areas to benefit logging needs.

Two proposed HMPs that would not affect energy development may be developed. The Cumberland Wetlands HMP would improve waterfowl production and wetland habitat along Albert Creek and associated drainages in the Cumberland Valley south of Kemmerer. The Kemmerer Riparian HMP would inventory remaining drainages with fisheries potential in the resource area and combine all data to set priorities for riparian and fisheries habitat restoration. Its main goals would be to improve bank stability and associated riparian vegetation, reduce sedimentation, and increase fisheries values. The Woodruff Narrows and Overthrust HMPs would not be completed or implemented.

The Pine Creek road and trails would remain open, when passable, to facilitate oil and gas activities that may occur in the area. Snowmobile access would remain unrestricted in the Rock Creek and Slate Creek elk winter ranges.

There would be no requirements for equipment crossings on perennial drainages.

RECREATION (Issue 6)

Recreation Potential

Same as Existing Management.

ORVs

Same as Existing Management.

Raymond Mountain WSA

If Congress decides that Raymond Mountain WSA (Map 6) would not be suitable for wilderness designation, it would again be leased for oil and gas, with standard stipulations. The wildlife ACEC would be dropped.

LAND RESOURCES

Land Tenure Adjustment (Issue 7)

Land tenure of the isolated parcels of public lands in Star Valley would be carried through as under Existing Management. Lands would be leased for R&PP purposes, lands adjacent to the National Forests would be transferred to Forest Service management and lands meeting the FLPMA criteria sold or exchanged.

Public lands in the rest of the KRA qualifying under the FLPMA sale criteria would be sold. Those lands needed for oil and gas development would receive highest priority. Lands with high mineral potential would not be sold if the change in surface ownership would inhibit oil and gas development.

Rights-of-Way (Issue 8)

There would be no seasonal restrictions on construction activities. Other stipulations associated with the construction on a right-of-way would follow the guidelines discussed under Soils.

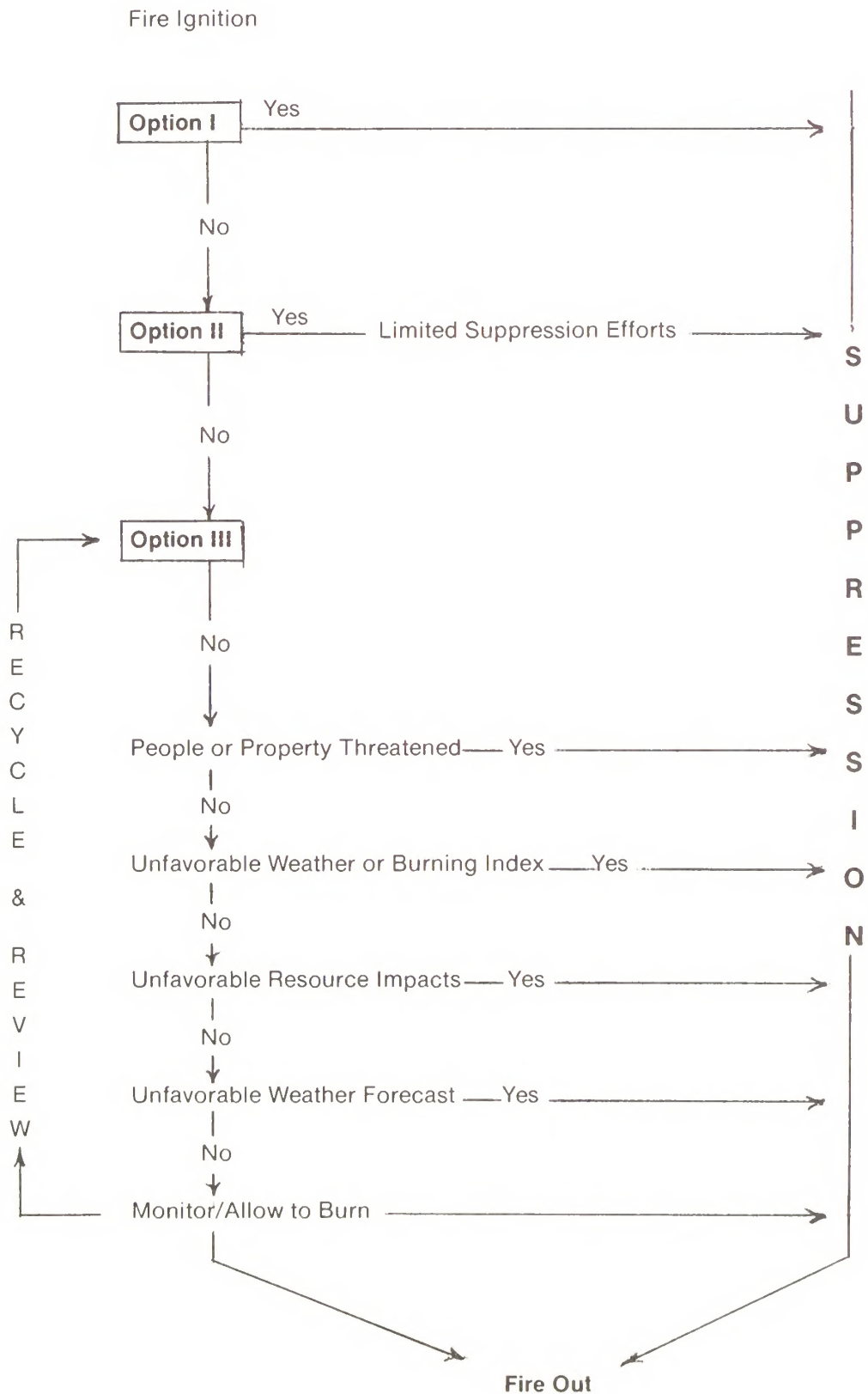
All existing communication site rights-of-way would be modified to allow subgranting to new users. Existing policies of allowing other users comment on interference would still be followed. A site development plan would be required and right-of-way holders would be responsible for adhering to applicable right-of-way regulations and FCC licensing requirements.

Access (Issue 9)

Acquisition of easements would continue as described in Management Common to All Alternatives, but priority would be assigned to acquiring access in the Meeks Cabin area in support of the Forestry program and in the

FIGURE 2-1

FIRE MANAGEMENT DECISION CHART



ALTERNATIVES

Raymond Canyon area to support legal public access to the Raymond Mountain WSA. Presently, legal access does not exist on this road. The county does not consider this a county road. At any time, the private landowner can close public access to the Raymond Mountain WSA.

There may also be other instances where access is desirable. Under this alternative, when an oil or gas well is a non-producer, the access road would not be reclaimed unless specified by the private landowner of any tracts crossed by the road. Legal public access across those parcels would be identified on a priority basis for other program needs. For instance, if a road could be utilized to access a high-use recreation area and another would just provide physical access to an area with light recreation use, the former would be identified for access acquisition.

Access into crucial wildlife areas would carry the same stipulations as under rights-of-way discussed above. These roads would be restored as near original condition as possible.

FIRE MANAGEMENT

The KRA is divided into nine fire management areas (Map 8) that are common to management objectives, topographic boundaries, or land ownership patterns. Each area is described in Appendix E-1.

Fire suppression efforts will be driven by potential property threatened or resource benefits derived. All new developments that create damage potential due to wildfire must have a fuel break stipulation adequate to prevent fire spread from the adjacent vegetation to the development.

The decision process on fire suppression follows the approach shown in Figure 2-1. If a need for full suppression is clearly indicated (Option I), suppression procedures are initiated. If full suppression is not needed and there are little or no benefits to be derived from fire (Option II), the costs of suppression and expected benefits are analyzed. This may result in limited suppression efforts. When fire may result in some benefits (Option III), four primary parameters are evaluated to determine if fire would result in potentially unacceptable impacts or in conditions which would make it difficult to control the burn. These are continually monitored throughout the course of the burn.

ALTERNATIVE B

This alternative emphasizes use of the public lands for grazing of livestock. Restrictions placed on livestock grazing would be minimized. Expenditures for range improvements would be greatest under this alternative. Mitigation measures for mineral development would be directed at benefitting livestock grazing.

AIR QUALITY (Issue 2)

Air resource management would remain, in general, much the same as under Existing Management. However, a more aggressive program would be instituted to protect public health and resource values in the event of an accidental release of H₂S. Oil and gas operators in areas of high potential for drilling H₂S containing wells and atmospheric dispersion into populated areas or areas of high resource concerns would be required to comply with special protective stipulations. Wells in areas of poor dispersion potential (Map A) would be especially scrutinized because of the added potential to have sour gas be poorly diluted by the atmosphere. These stipulations would include the onsite collection of meteorological data, the preparation of a detailed dispersion analysis to delineate areas of highest probable impact from potential H₂S releases, detailed evacuation plans for potentially impacted members of the public, and other site specific stipulations.

GEOLOGY AND MINERALS

Geophysical Exploration (Issue 1)

The following topics would be treated the same as under Existing Management: big game winter range; bald eagle roosting; raptor nests; elk calving; sage grouse; domestic sheep lambing; hunting areas; and threatened, endangered, and sensitive plants.

Muddy Areas

During muddy periods, the BLM would temporarily close parts of the KRA to truck-mounted seismic operations, including shot hole and vibrator methods. The areas and lengths of

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closure would depend on moisture conditions.

Riparian Areas

For the most part, geophysical exploration in riparian areas would be treated the same as under Existing Management. The exception is that the seed mixture used for stabilization would include riparian adapted species suitable for livestock forage.

Exclosures

Geophysical lines would be kept 500 feet from range and wildlife exclosures. The total area covered by exclosures in the KRA covers approximately 200 acres.

Oil and Gas (Issue 2)

This alternative would contain the same stipulations and procedures used under Existing Management, with two additions: "Oil and gas development will be allowed in lambing areas from June 20 through May 1." This wording, when inserted into standard stipulation No. 7 on leases, would close lambing areas to new drilling during the critical lambing period (May 1 to June 20).

In new gas fields which have a high potential for H₂S production, the field or unit operator would provide a dispersion analysis study for air quality. The study would be used by BLM to develop stipulations to protect human lives, livestock, and wildlife from hazardous effects of H₂S gas.

In areas of sensitive resource values or high probability of transport into residential areas, the operator may be required to establish on-site monitoring of windspeed, direction, and atmospheric stability. The goal of this monitoring would be to provide real time meteorologic data for dispersion analysis should an accidental H₂S release occur. The operator in these areas may also be required to submit information on "Calculated Absolute Open Flow" from the well(s) along with expected or real H₂S gas stream concentration so that an emission factor can be calculated quickly during an accidental release. In these areas, the operator may be required to conduct real time dispersion analysis to aid in area evacuations or other actions to avoid loss of life or property during an uncontrolled H₂S release.

Due to high water erosion hazard throughout the KRA, limited development will be permitted on slopes from 25 percent to 40 percent, and no surface disturbance on those slopes greater than 40 percent. In landslide-prone areas (Map A), drill sites would be moved, if possible, to safe areas. Access roads, pipelines, and other facilities would be routed around the slide areas.

The rest of Alternative B is same as Existing Management.

SOILS

Management of the soil resource would continue as in Existing Management, however, high priority would be given to general soil survey (Order III) with emphasis on range management interpretations. Site specific soil inventories for rangeland monitoring would continue during AMP development.

Reclamation (Issue 3)

On road rights-of-way, vegetation and topsoil would be stripped and stockpiled during construction. Upon abandonment, roads would be recontoured, surfaced with topsoil, water barred, and seeded on the contour. Seed mixtures for disturbances would be tailored to soil stabilization and livestock palatability. No erosion control measures other than water bars would be required. Roads retained for access would be covered with topsoil and seeded on all unused portions. Where possible, on disturbances requiring minor excavation (e.g., communication lines and pipelines) vegetation would be stripped to mineral soil using mechanical means, leaving topsoil in place. This action would allow for faster regeneration because root mass is left intact and undisturbed.

For oil and gas well disturbances, all points in the Surface Use Plan would be reviewed. Point 10 (reclamation) of the Surface Use Plan, would be satisfied with an ERRP (Appendix C). The ERRP would be a detailed plan developed by the operator, and reviewed and approved by the BLM. Upon approval, the operator would implement the plan.

In addition to the ERRP, special consideration would be given to low precipitation zones (generally less than 8 to 10 inches) after the location is abandoned. Reseeding is often unsuccessful in these areas; moisture traps such

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as snow fences or depressions (formed by pitting disks or contour furrowers) may be required to increase moisture retention on the site.

Before construction, topsoil would be stripped from proposed well pad disturbance. During the construction phase, all topsoil would be stockpiled in a linear fashion. Abandoned locations would be resurfaced with topsoil and drill seeded on the contour to increase germination success. If necessary to produce adequate germination and growth, topsoil would be inoculated with soil micro-organisms and fertilized. Fertilization of the site at or near the time of planting can be expected to greatly enhance the chances of successfully establishing an adequate vegetative cover (Taylor, 1983). Seeding would include species promoting soil stability and livestock palatability. Fencing would follow this initial reclamation work to prevent premature utilization and loss of protective ground cover. Total expected time for successful reclamation would be four years, assuming normal precipitation.

On producing locations, all unused portions would be reduced to a minimum of 3:1 slopes, recontoured, resurfaced with topsoil, and seeded with species that promote soil stability and livestock palatability. If nutrient deficiencies are noted, fertilization may be required.

Offsite mitigation may be required for loss of grazing land. This could consist of, but would not be limited to, fencing systems, developing waters, or contributing to land treatment. The type of mitigation would be determined on a case-by-case basis.

Reclamation success has been documented to be most successful on slopes less than 25 percent. This success is contingent on adequate revegetation and restoration plans and adequate precipitation. On slopes of 25 to 40 percent, success has been variable and contingent on detailed engineering and rehabilitation plans along with rigorous compliance. On slopes over 40 percent, revegetation and restoration are extremely difficult, costly, and erosion potential is high. Due to these facts, under this alternative development of well sites, fields, and plant facilities will be especially limited in the 25 percent to 40 percent slope areas (approximately 74,000 acres in the KRA) and restricted unless erosion controls can be ensured and adequate revegetation expected. This would require detailed engineering proposals and intensive revegetation and restoration proposals. Development on greater than 40 percent slopes would be restricted on a site specific basis (approximately 68,000 acres in the KRA).

Detailed maps depicting these slope areas are available at the KRA office.

LIVESTOCK MANAGEMENT (Issue 4)

Grazing Preference

The main emphasis under this alternative would be the production of forage for consumption by livestock. This would be accomplished with limited protection or enhancement of wildlife, watershed, and soil resource values. The overall objective would be to improve range condition on all "I" category allotments and prevent a decline in condition on all others. This alternative would increase the present active preference of 162,000 AUMs by 46,414 AUMs to 208,414 AUMs by implementing the actions shown on Appendix A-2.

Allotment Management Plans

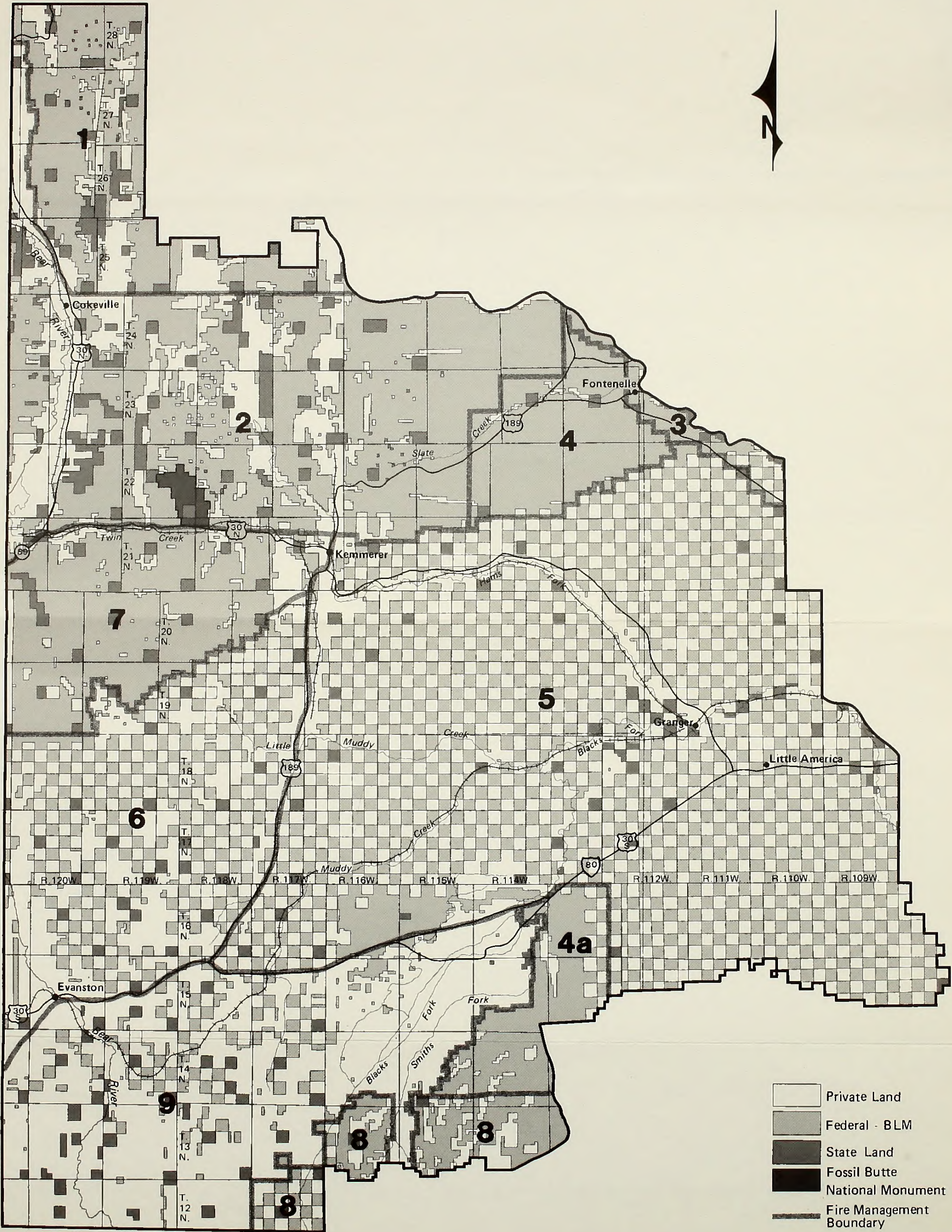
AMPs would be developed for 34 "I" allotments in approximately the order of priority shown in Table 2-2. Existing AMPs would continue to be followed on Willow Creek, Bench, Poison Creek, Beaver Creek, and Rock Creek allotments until monitoring and evaluation indicate that a change in management is necessary.

Range Improvements

All new range improvement projects would be designed and constructed to benefit livestock grazing, with other resources receiving secondary consideration. Types and numbers of projects to be implemented are summarized in Appendix A-2. Range improvements would be authorized on all allotments in order of priority i.e., "I", "M", and "C"). This alternative has a benefit to cost ratio of minus 1.15 and a present net value of minus \$5,467,256, which means that each dollar in benefits costs \$1.15 to produce.

Forage Increases

Long-term increases in forage of 46,414 AUMs would be allocated first to livestock grazing. Other resources would be secondary. These AUMs would be used to restore suspended preference. Once total preference is achieved, additional AUMs would be allocated proportionately among competing resources.



**Taken from the Kemmerer Resource Area Fire Management Plan.

- Private Land
- Federal - BLM
- State Land
- Fossil Butte National Monument
- Fire Management Boundary
- 3** Fire Management Area Number

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Combining Allotments

The Cottonwood Bench and Lyman Cattle allotments could be combined, as well as Christy Canyon and Boyd Hollow allotments. The Cumberland Allotment would be restructured into smaller, more manageable units.

Rangeland Monitoring and Evaluation

All “I” and high priority “M” allotments would be monitored at high intensity (trend, utilization, climate, and actual use). The other “M” and all “C” category allotments would be monitored as priorities warrant and to a level sufficient to meet allotment objectives. Ecological site condition mapping would occur as described in Alternative A.

Vegetation Manipulation

Approximately 136,960 acres of vegetation manipulation are proposed under this alternative. Conversions in vegetation type may occur in big game ranges or sage grouse nesting areas to meet objectives for livestock forage production.

Interagency Cooperative Management Plans

Cooperative plans would be developed between the Forest Service and the BLM on the Trespass Creek, Inchauspe, Pole Creek, Hobble Creek, and Mayfield allotments.

Non-Alloted Public Lands

The 646 AUMs on 4,500 acres of unallotted public lands would be licensed for grazing. None of these acres would be disposed of by the Lands program.

Conversions in Kind

Conversions in kind of livestock would occur only after a study of suitability for conversion has been completed. Each proposed conversion would be analysed through environmental assessment.

Riparian

Riparian areas would be treated the same as described in Alternative A. Grazing practices would be directed towards utilization levels which would maximize forage production without a decline in trend.

Allotment Categorization

Same as Existing Management.

Cooperative Management Agreements

Cooperative management agreements may be developed as in Existing Management. However, the process would be pursued more rigorously under this alternative.

FISH AND WILDLIFE HABITAT (Issue 5)

Proposed management for oil and gas and logging and construction activities in riparian areas would be similar to Alternative A (see Minerals). Reclamation practices in riparian areas would favor establishment of palatable livestock forage (see Soils). Riparian areas would receive moderate to heavy grazing pressure as long as they were maintained in current condition. Livestock conversions would continue to only benefit livestock production and user preference.

The Raymond Mountain ACEC Plan, including the Thomas Fork HMP, would be implemented on schedule as long as livestock grazing was not adversely affected.

The Overthrust and Woodruff Narrows HMPs would still be written under this alternative; however, proposed actions would not impact livestock movements or reduce available forage. The Cumberland Wetlands and Kemmerer Riparian HMPs would not be completed due to possible adverse impacts to livestock grazing or reductions in available AUMs.

Mitigation and seasonal restrictions to minimize impacts from oil/gas development would remain the same as Existing Management. Sage grouse restrictions would be the same as Existing Management.

The Pine Creek road and trails would remain open all year to facilitate any use necessary for livestock trailing. Snowmobile access would remain unrestricted in the Rock Creek and Slate Creek elk winter ranges.

There would be no requirements for equipment crossings on perennial drainages.

RECREATION (Issue 6)

Recreation Potential

Same as Existing Management.

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ORVs

Same as Existing Management.

Raymond Mountain WSA

The Raymond Mountain ACEC would continue to be implemented. The ORV closures would remain and the stipulations on oil and gas leases would be applied to allow maximum protection of recreational and wildlife values in the WSA.

LAND RESOURCES

Land Tenure Adjustment (Issue 7)

Primary emphasis for land tenure adjustment in the Star Valley area would be to transfer jurisdiction over the lands to other Federal agencies, e.g., the Forest Service or BLM in Idaho. These agencies would be responsible for authorizing grazing use on the affected public lands.

All lands identified for sale would have to meet FLPMA criteria. Priority for sale would be assigned to lands that are presently not under grazing lease or permit. The next priority would be assigned to lands upon which grazing operators would relinquish their grazing authorizations voluntarily; or where it has been determined that a reduction in grazing authorization is needed (the AUM reduction represents a minor part of the total AUMs authorized within an allotment).

Land exchanges that benefit range management would be given priority over other exchanges.

Rights-of-Way (Issue 8)

Rights-of-way would continue to be processed as under Management Common to All Alternatives, however, mitigating measures and the resulting stipulations would emphasize livestock management.

Seasonal use stipulations would be implemented in domestic sheep lambing areas. Waiving of the restriction as described under Existing Management would not be allowed. Construction activities on affected rights-of-way would have to avoid lambing areas during this period.

Rehabilitation of disturbed areas would be done with soil stabilizing species that are preferred by livestock. Small sites within areas of concentrated grazing would be fenced to ensure that reclamation is successful. Access along linear rights-of-way would be blocked with water bars to reduce public travel and promote more complete re-establishment of vegetation. The following methods would be employed on reseeded areas:

1. Rights-of-way in areas of concentrated grazing use would be fenced until the vegetation was well established and could withstand grazing pressure.
2. Access along linear rights-of-way would be blocked to the general public at major access points to prevent disturbance of reclaimed areas.
3. Reclamation procedures could include a second planting with species suitable for livestock grazing once ground cover was established.

Communication sites would be managed as in Existing Management.

Access (Issue 9)

Emphasis would be placed on obtaining legal access to the following: Star Ranch on Muddy Creek, the north end of Lake Viva Naughton, Smiths Fork Road, Dee Ranch Road, and Warfield Springs. The above are in support of grazing operations.

FIRE MANAGEMENT

Same as Alternative A.

ALTERNATIVE C

This alternative is intended to achieve a greater degree of benefit to wildlife and watershed resources. Mineral exploration and development has the greatest degree of restrictions of any alternative examined in detail. Mitigation measures would be directed at benefitting wildlife rather than livestock. Restrictions on use of riparian areas by livestock and by mineral development would also be intended to benefit

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watershed values by reducing erosion and salinity.

AIR QUALITY (Issue 2)

Air resource management practices under this alternative would remain the same as under Alternative B.

GEOLOGY AND MINERALS

Geophysical Exploration (Issue 1)

Big Game Winter Range

The most critical parts of big game winter ranges (Map B) would be closed to geophysical lines from December 1 to May 15, without exception. The rest of the winter range areas would be treated as under Existing Management, with proposed lines reviewed on a case-by-case basis. A stipulation for portable geophysical operations would require helicopters to avoid flying closer than 500 feet from big game within

Bald Eagle Roosting

A 1-mile buffer zone would be closed, to seismic lines, around roosting areas from November 1 to April 30.

Raptor Nests

No seismic line activity would be allowed within 1 mile of a nest for the following species and seasons: Golden Eagle - February 1 to August 1; Prairie Falcon - March 1 to August 1; and Ferruginous Hawk - March 1 to August 1.

Elk Calving

Elk calving areas (Map B) would be closed to geophysical exploration from May 15 to June 30.

Sage Grouse

No occupancy or other surface disturbance would be allowed within a 1,320-foot radius of the center of a sage grouse strutting ground (lek). The following exceptions may be specifically authorized in writing by the Area Manager:

1. Surface disturbance would be allowed from June 1 to March 14 if the area could be

returned to acceptable habitat (i.e., relatively flat with no obstructions) before March 15, or

2. A field exam could determine the specific area used for strutting, in which case the above stipulation would apply only to the actual lek site and a 500-foot buffer zone around the perimeter, or
3. Nonsurface-disturbing activities would be allowed any time from June 1 to March 14. From March 15 to May 31, nonsurface-disturbing activities would be allowed from 10:00 a.m. to 7:00 p.m. MST from March 15 to May 31.

Domestic Sheep Lambing

Same as Existing Management.

Hunting Areas

From the beginning of archery season for elk, deer, and moose until the end of rifle season, the areas that would be closed would involve the area currently closed plus part of Bear River Divide and Meeks Cabin areas.

Muddy Areas

Same as Alternative B.

Riparian Areas

No crossings of perennial streams would be allowed except on established roads unless temporary bridges are provided. Disturbances would be seeded with a species that will stabilize the soil and provide for wildlife habitat. No surface disturbance would be allowed within 500 feet of all perennial creeks. No surface disturbance of riparian vegetation would be allowed.

Exclosures

Same as Alternative B.

Threatened, Endangered, and Sensitive Plants

Four populations of *Physaria dornii* are covered by "no surface occupancy" stipulations. An example of a cushion plant community containing five endemic plant species is also covered by a "no surface occupancy" stipulation. The total acreage for the five areas containing these plants is less than one thousand acres.

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Oil and Gas (Issue 2)

Oil and gas leases would follow the same procedures as Existing Management, except for the following:

1. The following important wildlife habitat would be withdrawn from mineral leasing under this alternative (Map B): Raymond Mountain, Rock Creek, and Slate Creek elk and mule deer crucial winter ranges (in part); and Woodruff Narrows and Morgan Canyon bald eagle winter roost sites. Offsite mitigation to improve habitat would be required for all surface disturbance within all mule deer and elk crucial winter ranges not withdrawn from leasing, and for all sage grouse strutting and nesting areas. Mitigation would include habitat improvement projects (i.e., burning, water development, fertilization) in adjacent areas within the same herd unit or nesting area to increase production and offset lost production. These projects would be entirely funded by the initiating activity (i.e., oil or gas company). Maximum costs would not exceed \$10,000 per acre of surface disturbance (adjusted yearly for inflation).
2. Threatened, endangered, and sensitive plant sites would have a "no surface occupancy" stipulation placed on them. New leases would have the "no surface occupancy" stipulation attached when they are issued.
3. The distances used in lease stipulations for historic trails and live water situations (1,320 feet and 500 feet, respectively) would be minimum values. In some situations, those distances would be increased. Also, riparian areas would be treated as live water areas.
4. There would be no surface disturbance on slopes greater than 40 percent. A surface use plan would be required between 25 and 40 percent slope areas.
5. A new stipulation would be added to all new leases as they are issued: "No surface occupancy in wet meadows or subirrigated areas."
6. No surface disturbance would be allowed within 1-mile of raptor nests (Map B) during the same time periods discussed under Geophysical Exploration under this alternative.

On APDs where the lease has no wildlife stipulations, this alternative would add similar conditions to the APD, if necessary. There could

include conditions for big game winter range, elk calving, sage grouse, etc. The conditions would be worded to protect the resources as under the lease stipulation.

This alternative would designate "minimize access" areas, in which road development would be limited. These would consist of parts of the crucial big game winter ranges and areas of critical erosion (Maps A and B). Access roads for oil and gas wells would avoid those areas, if possible. Access for wells that are staked in the "minimize access areas" would be reviewed to cause the least possible impacts to wildlife habitat.

In areas of sensitive resource values or high probability of transport of H₂S into residential areas, the operator may be required to establish on-site monitoring of windspeed, direction, and atmospheric stability. The goal of this monitoring would be to provide real time meteorologic data for dispersion analysis should an accidental H₂S release occur. The operator in these areas may also be required to submit information on "Calculated Absolute Open Flow" from the well(s) along with expected or real H₂S gas stream concentration so that an emission factor can be calculated quickly during an accidental release event. In these areas, the operator may be required to conduct real time dispersion analysis to aid in area evacuations or other actions to avoid loss of life or property during an uncontrolled H₂S release.

In landslide prone areas (Map A), proposed drill sites would be moved to safe areas, if possible. Access roads, pipelines, and other facilities would be routed around potential landslide areas.

SOILS

Management of the soil resource would continue as in Existing Management, however, high priority would be given to general soil survey (Order III) with emphasis on erosion potentials and watershed management interpretations. Site specific soil inventories for watershed treatments and accelerated erosion control would be conducted as described in Watershed Management Plans.

Reclamation (Issue 3)

Disturbances created by the construction of pipelines, roads, and power and communication lines would be reclaimed as in Alternative B,

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except that the disturbances would be seeded with multiple species for soil stability and wildlife enhancement. Vegetation would be stripped to mineral soil by mechanical treatment. This would allow for quicker revegetation, since the root mass is left intact and undisturbed.

For proposed wells and other large disturbances, the Surface Use Plan and the ERRP are reviewed. Under this alternative, the ERRP would include wildlife and watershed enhancement or mitigation measures. Before construction, topsoil would be stripped. During the construction phase, all topsoil would be stockpiled in a linear fashion.

Abandoned locations would be resurfaced with topsoil and drill seeded on the contour to increase germination success. Where slopes exceed 30 percent and surface rock content is greater than 35 percent, broadcast seeding would be acceptable at twice the drilling rate. Broadcast seed would be covered (i.e., raked) to increase germination. If necessary to produce adequate germination and growth, topsoil would be inoculated with soil micro-organisms and fertilized. Fertilization of the site at or near the time of planting can be expected to greatly enhance the chances of successfully establishing an adequate vegetative cover (Taylor, 1983). Seeding would include species promoting soil stability and wildlife habitat. Fencing would follow this initial reclamation work to prevent premature utilization and loss of protective ground cover. Total expected time for successful reclamation would be four years, assuming normal precipitation.

The installation of snow fences and the construction of shallow depressions may be required in dryer regions (less than 10 inches of annual precipitation) to increase effective moisture on the site.

If a well becomes a producer, all unused pad portions would be reduced to a minimum of 3:1 slopes, recontoured, surfaced with topsoil, then seeded in the manner above. In addition to water bars, erosion would be controlled by mulching or matting. If nutrient deficiencies are noted, fertilization may be required.

Since wildlife habitat would be lost on permanent disturbances, an offsite mitigation program would be required to compensate for the loss of wildlife habitat (see Issue 5).

Slope limitations on development are the same as Alternative B.

LIVESTOCK MANAGEMENT (Issue 4)

Grazing Preference

The overall management objective of this alternative would be to protect or improve vegetative cover and available forage for wildlife and for watershed resources in critical areas, and to prevent overgrazing by livestock. This alternative would decrease the present active preference of 162,000 AUMs to 123,820 AUMs. This is the average yearly number of AUMs actually licensed in the KRA for the past five years. The 38,180 AUMs of non-use would be held as suspended preference.

Allotment Management Plans

New AMPs would be developed for 18 "I" category allotments in approximately the order of priority shown in Table 2-2. Existing AMPs would continue to be followed in the Willow Creek, Bench, Poison Creek, Beaver Creek, and Rock Creek allotments until monitoring and evaluation dictate that a change in management is necessary. New and existing AMPs would be designed to enhance wildlife habitat and watershed conditions. This may be done at the expense of livestock grazing, where necessary.

Range Improvements

All new range improvements would be designed to benefit wildlife and watershed/soils resources. Livestock benefits would be secondary. Those types and numbers of improvements to be implemented on "I" category allotments under this alternative are summarized in Appendix A-2. No new livestock waters would be developed in areas of crucial winter range. Maintenance of range improvements would be assigned to the benefitting user. This alternative has a benefit to cost ratio of 1.39 and a present net value of \$389,317.

Forage Increases

Long term increases in forage would be allocated to meet the requirements of the Wyoming Game and Fish Strategic Plan for wildlife numbers, and watershed uses. No increases in livestock grazing preference are proposed.

ALTERNATIVES

Combining Allotments

The Cottonwood Bench and Lyman Cattle allotments and the Boyd Hollow and Christy Canyon allotments could be combined.

Rangeland Monitoring and Evaluation

Monitoring would be implemented at a level sufficient to detect grazing use in excess of objectives established for key habitat areas. Use supervision would be more intensive under this alternative than under Alternative B. "M" and "C" allotments would be monitored at a low intensity except in areas of crucial wildlife habitat. Ecological site condition mapping would occur as described in Alternative A.

Vegetation Manipulation

Approximately 33,500 acres of vegetation manipulation are proposed under this alternative. Prescribed fire would be the preferred technique for conversion of brush to grassland. No vegetation manipulation would be proposed within one-quarter mile of sage grouse strutting areas.

Interagency Cooperative Management Plans

No cooperative livestock management plans would be developed between the Forest Service and the BLM.

Non-Alloted Public Lands

The 4,500 acres of unallotted public lands (646 AUMs) would remain unlicensed.

Conversions in Kind

Conversions in kind would be allowed only if the action would benefit wildlife and watershed resources. The Smiths Fork Allotment would be returned to sheep grazing only. Lambing areas on Smiths Fork would be rotated from year to year. No conversions in kind of livestock would be allowed in allotments with riparian conflicts without an accompanying management plan.

Riparian

Grazing management would be directed towards improvement of riparian areas. Utilization of key riparian grasses would be set at 40 percent. This objective may necessitate

such actions as reducing livestock numbers, fencing riparian areas, conversion from cattle to sheep, herding, etc.

Allotment Categorization

Same as Existing Management.

Cooperative Management Agreements

Same as Existing Management. However, CMAs would only be granted under circumstances where the action would enhance wildlife habitat or have no net effect.

FISH AND WILDLIFE HABITAT (Issue 5)

Riparian habitat protection would be considered in all program actions (Table 2-1). Mineral development would only be allowed outside the riparian zone. Mitigation would be required to maintain riparian condition and protect fisheries values. Off-site habitat improvement would be required to mitigate loss of riparian habitat production. Logging and road construction would minimize impacts to riparian areas by the use of bridges when crossing perennial drainages and the use of stream stability structures.

Livestock grazing practices would be altered to improve riparian condition in all "I" allotments. This would require AUM reductions in many cases (see Issue 5). Riparian exclosures would be required in areas where other grazing control measures were not possible. Utilization of key riparian grasses or shrubs could not exceed 40 percent on any riparian area. No conversion of sheep to cattle would be allowed in areas with livestock/riparian conflicts, and the Smiths Fork Allotment would be returned to sheep use.

The Raymond Mountain ACEC would be implemented in its present form. In addition, if the WSA is not designated as a Wilderness Area, substantial mitigation measures would be required to protect fisheries values from oil/gas related impacts. An NSO stipulation would be applied to a ¼-mile buffer zone around all perennial creeks in the ACEC area.

Four new HMPs would be prepared: Woodruff Narrows, Cumberland Wetlands, Overthrust, and Kemmerer Riparian. Although coordinated with other resources, these HMPs would favor wildlife management goals.

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Waterfowl habitat improvement - completed pothole

The Pine Creek road would be upgraded to reduce erosion into Pine Creek. All existing trails leading north along Dempsey Ridge from Pine Creek road would be closed, except for the Nugent Park access road. The Rock Creek elk crucial winter ranges would be closed to over-the-snow machines from December 1 to May 1. The Slate Creek mule deer and elk winter range would be closed to over-the-snow machines, as needed, through coordination with the Wyoming Game and Fish Department.

The use of bridges would be required for equipment crossings on perennial streams. Stream stability structures (rip-rap) would be required, if needed.

RECREATION (Issue 6)

Recreation Potential

Three recreation area management plans (RAMPs) would be developed for prime areas of recreation potential (Appendix H) for future

development. The plans would reflect development needs for Commissary Ridge, Dempsey Ridge, Raymond Mountain, Pine Creek, Upper Smith's Fork, and Upper Hams Fork. Anticipated development would include picnic tables and fire rings, water and toilets at all locations, and horse corrals in the Raymond Mountain area, Upper Hams Fork, Upper Smith's Fork, and Dempsey Ridge. The RAMPs would determine, in detail, the use and needs for these areas as well as the types of facilities to be constructed.

ORVs

Most of the KRA would be designated "limited" (1,600,054 acres) to existing roads and trails except for necessary tasks. Necessary tasks are defined as work requiring the use of a motor vehicle. Examples include picking up big game kills, repairing range improvements, managing livestock, and mineral activities where surface disturbance does not total more than five acres as described in the "five-acre exemption" under 43 CFR 3809. The areas designated as "closed"

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are in the Raymond Mountain area (32,946 acres).

The KRA would remain open to snowmobile use, except for a seasonal closure (December 1 to May 1) in the Rock Creek and Slate Creek elk winter range. Emergency closures or restrictions may be imposed for resource generated emergencies. Roads that have been proposed for closure are: a one-mile segment of the Westfall Hollow area, and a three-mile segment of the rock slide area of the Sublette Cutoff of the Oregon Trail, a two-mile segment of the Dempsey-Hockaday Trail on the east side of Commissary Ridge, and the Slide Rock Trail. Pine Creek Road would be evaluated for use and possible closing.

The ORV designations would match Forest Service designations at the boundary of the Bridger-Teton and Wasatch National Forests. A "limited" designation on BLM lands would be compatible with the Bridger-Teton. The Wasatch designations would require different restrictions. The public lands in Section 25, 26, 32, 33, 34, T. 13 N., R. 116 W., would comply with USFS Designation 3 (open to motorized wheel vehicles on designated roads, closed to over-the-snow machines operating on snow). Section 30, T. 13 N., R. 115 W. would be designated to conform with the USFS Designation 3. Sections 24, 26, 27, 34, T. 13 N., R. 115 W. would be designated to conform with the USFS Designation 5 (open to over-the-snow machines on designated routes only, open to motorized wheel vehicles on designated roads). Section 19 T. 13 N., R. 114 W., USFS Designation 5.

Raymond Mountain WSA

The Raymond Mountain ACEC plan would continue to be implemented. The ORV closures would remain and the stipulations on oil and gas leases would be applied to provide maximum protection of recreational and wildlife values in the WSA.

LAND RESOURCES

Land Tenure Adjustment (Issue 7)

Potential sale parcels identified as having crucial wildlife habitat values would be retained by the BLM or transferred to another agency for management of wildlife values. This would include parcels containing habitat needed for Federally listed threatened or endangered

species and for State-listed sensitive species. Any Federally managed land supporting threatened or endangered species habitats would remain in Federal ownership.

Lands with other kinds of values could be disposed of with reservations to protect habitat, public access for hunting purposes, or fishing access to a stream. Other reservations may require that no residential development occur on a parcel or that residential development be restricted to one residence. These types of restrictions would be difficult to enforce.

This alternative would most likely reduce the number of sales, exchanges, and R&PPs that would occur in the KRA.

Rights-of-Way (Issue 8)

Critical erosion areas and the most crucial winter range would be designated as minimum access areas. Whenever a proposed right-of-way would encroach on these areas, an attempt would be made to reroute the right-of-way to avoid it, or seasonal restrictions on construction would be used with no opportunities for waivers of seasonal restrictions.

Management of communication sites would be the same as Alternative A.

Access (Issue 9)

Priorities for acquisition of legal access would be for Meeks Cabin, Raymond Canyon, Coal Creek Road, and an alternate route to the Pine Creek area.

FIRE MANAGEMENT

Same as Alternative A.

ALTERNATIVE D

This alternative provides that no forage from the public lands would be licensed to livestock operators. Grazing would still occur on public lands until existing permits expire. Restrictions on mineral exploration and development would be less than under Existing Management but greater than under Alternative A. Additional restrictions would be the same as under Existing Management. This would be considered the "No Grazing" alternative.

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AIR QUALITY (Issue 2)

Air resource management in the KRA under this alternative would remain the same as under Existing Management. Agency stipulations would be somewhat less intensive for the planning of accidental H₂S contingency than under Alternatives B and C.

GEOLOGY AND MINERALS

Geophysical Exploration (Issue 1)

The following would be treated the same as Existing Management: big game winter range; bald eagle roosting; raptor nests; elk calving; sage grouse; hunting areas; muddy areas; riparian areas; exclosures; and threatened, endangered, and sensitive plants.

Domestic Sheep Lambing Areas

Same as Alternative A.

Oil and Gas (Issue 2)

Lease stipulations and other aspects of oil and gas would be the same as Existing Management.

SOILS

Management of the soil resource would continue as in Existing Management, however, at lower levels of inventory. Priorities would be given to development needs, such as soil interpretations for construction and topsoil depths for reclamation. No interpretations for range management would be needed.

Reclamation (Issue 3)

All pipelines, road rights-of-way, and power and communication lines would be reclaimed as prescribed under Alternative A. No special consideration would be given to range or wildlife since only one site-specific soil stabilizing grass species would be required.

On large disturbances (well pads, plant sites), the Surface Use Plan and ERRP would be reviewed for completeness.

Abandoned locations would be reshaped, recontoured, covered with topsoil, and seeded to stabilize soil. Seed would be drilled or broadcast. Revegetation would be the only means of erosion control. No timeframe would be set for completed reclamation but total reclamation would be expected. No fencing or weed control would be required.

On producing locations, all unused portions would be reduced to a minimum of 3:1 slopes, recontoured, covered with topsoil, and seeded to stabilize the soil. Revegetation would be the only means of erosion control.

No offsite mitigation for surface disturbance would occur. Slope limitations on development would remain as in Alternative B.

LIVESTOCK MANAGEMENT (Issue 4)

Grazing Preference

A strict “no grazing” alternative is not feasible due to the intermingled land ownership pattern (private, State, and public lands). No forage from the public lands would be licensed to livestock operators, but each present operator having unfenced privately owned or controlled lands would be allowed to maintain the recognized stocking rates of their privately controlled lands over the entire allotment. As a result, only the privately controlled stocking levels which exist today would be allowed on the public lands. Any grazing use of the Federal lands would require an exchange of use agreement. Livestock operators who do not wish to enter into such an agreement, or who may wish to graze more livestock on their privately owned or controlled lands may do so if their animals are fenced in on the private lands. Livestock operators currently utilizing public rangelands who do not have privately owned or controlled lands within an allotment would not be allowed to graze livestock on public lands. Permits falling into this category would be cancelled.

This alternative would eliminate all Federally licensed AUMs. (The total available grazing level of 283,982 AUMs on public, State, and private land would be reduced by 162,000 AUMs from public land to a total of 121,982 AUMs from State and private land within the boundaries of the KRA.)

ALTERNATIVES

Allotment Management Plans

No AMPs would be developed. Existing AMPs would be cancelled.

Range Improvements

No new range improvements would be authorized on the public lands. The Bureau would be required to install approximately 300 miles of fence to separate solid block public land from checkerboard or intermingled private lands. Maintenance of existing improvements would be assigned to benefitting users. No benefit to cost ratio could be calculated for this alternative because no range improvements are proposed. This alternative would have a present net value of \$3,318,418. This figure, however, does not include the impacts of a “no grazing” alternative to the livestock operators (see Socioeconomics).

Forage Increases

No increases in stocking numbers would be authorized. If a landowner felt the private land production had increased, BLM would require fencing of those lands prior to increasing stocking.

Combining Allotments

No allotments would be combined.

Rangeland Monitoring and Evaluation

Monitoring would continue only on those allotments where exchange of use agreements could be negotiated. No ecological site condition mapping would occur.

Vegetation Manipulation

No vegetation manipulation projects to improve livestock forage would be proposed.

Interagency Cooperative Management Plans

These plans could still be prepared under this alternative since the allotments in question would be under the jurisdiction of the Forest Service. These allotments include Trespass Creek, Inchauspe, Hobble Creek, Pole Creek, and Mayfield.

Non-Alloted Public Lands

These lands would be offered for sale to adjacent land owners.

Conversions in Kind

Conversions in kind of livestock would be allowed only after a study of suitability for conversion was completed and only if the change is compatible with other resource objectives. All conversions would be subject to environmental assessment.

Riparian

No special considerations would be needed. Livestock grazing would be eliminated from many of the existing conflict areas.

Allotment Categorization

No categorization would be necessary.

Cooperative Management Agreements

No cooperative management agreements for livestock would be developed.

FISH AND WILDLIFE HABITAT (Issue 5)

All proposed actions to manage riparian and terrestrial wildlife habitat would remain the same as Existing Management, with the following exception. If no federal AUMs would be licensed, grazing pressures would be reduced on riparian habitat, especially those areas with a high percentage of public land, and no special management would be required to maintain existing riparian condition.

The requirements for equipment crossings on perennial streams would be the same as those under Existing Management.

RECREATION (Issue 6)

Recreation Potential

Fewer RAMPs and facilities would be proposed and implemented.

ALTERNATIVES

ORVs

Same as Alternative C.

Raymond Mountain WSA

Same as Alternative C.

LAND RESOURCES

Land Tenure Adjustment (Issue 7)

Land disposal under this alternative would be the maximum amount possible. All lands in Star Valley would be sold unless significant wildlife habitat was identified during the EA/Land Report. Those parcels with wildlife values would be proposed for transfer to the Forest Service or Wyoming Game and Fish Department.

All other lands identified for sale (Appendix D) would be sold if they met FLPMA requirements and the EA/Land Report did not identify any significant environmental impacts.

The Forest Service has requested that BLM lands located near the Wasatch Forest be transferred to their management (approximately 74,000 acres).

Rights-of-Way (Issue 8)

Right-of-way issuance would continue with no general closed areas for season of use. The seasonal use stipulations for winter ranges, strutting grounds, etc. would be used but could be waived by the Area Manager. Special stipulations would be used to maintain multiple use management.

Communication sites would be handled as described in Existing Management.

Access (Issue 9)

Access priorities would be based upon acquisition of public access to benefit multiple programs. Access developed by the oil and gas industry would remain open and access across private lands would be sought. Very few roads would be restored. Access in the Raymond Mountain WSA would be managed on the basis of the Interim Wilderness Management Policy.

FIRE MANAGEMENT

Same as Alternative A.

ALTERNATIVE E

This alternative represents a selection of proposed management actions which resolve the planning issues and provide multiple-use management of the public lands and resources so that they are utilized in a combination that would meet present and future needs. No resource or resource user would be emphasized to the overall detriment of others. The need for development of mineral resources would be met. Means to mitigate adverse impacts of such development, without precluding it, have been identified. This would be the Bureau's preferred alternative.

AIR QUALITY (Issue 2)

Air resource management under this alternative would be the same as under Alternative B.

GEOLOGY AND MINERALS

Geophysical Exploration (Issue 1)

Big Game Winter Range

Same as Alternative C.

Bald Eagle Roosting

A 1-mile buffer zone around roosting areas (Map B) would be closed to geophysical operations from December 1 to April 1 to seismic lines.

Raptor Nests

No activity would be allowed within one-half mile of a nest for the following species and seasons: Golden Eagle, February 15 to June 1; Prairie Falcon, March 15 to June 15; Ferruginous Hawk, March 15 to June 15.7

Elk Calving

Same as Existing Management.

Sage Grouse

Same as Alternative C.

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Domestic Sheep Lambing

Only those parts of the lambing area actually in use would be closed from May 1 to June 20. The seismic operator would be responsible for contacting the sheep permittees.

Hunting Areas

Same as Existing Management.

Muddy Areas

Same as Alternative B.

Riparian Areas

No surface disturbance would be allowed within 300 feet of perennial streams or live water. Crossings of perennial streams would be minimized. This is especially important where there is a high density of riparian areas. The use of established roads, temporary bridges, or portable seismic operations (helicopter) would be the preferred method. When rehabilitation of a riparian area would be required, the primary objective would be to stabilize soil. Desired species composition after rehabilitation would be dependent on site-specific objectives. Reestablishment of riparian vegetation would often be a key objective.

Exclosures

Same as Alternative B.

Threatened, Endangered, and Sensitive Plants

Same as Alternative C.

Oil and Gas (Issue 2)

Areas withdrawn from leasing under Alternative C would not be withdrawn.

Lease stipulations and "no access" areas would be the same as Existing Management, except for mitigation for bald eagle roosts and big game winter range. There would be a "no surface occupancy" stipulation placed on leases for the Woodruff Narrows (240 acres) and Morgan Canyon (800 acres) bald eagle roosts (Map B). In the most important crucial winter range, conditions to protect wildlife would be added to APDs if similar stipulations are not on the lease. A threshold level of 10 percent disturbance of crucial big game habitat or sage grouse nesting areas would be set (see Fish and Wildlife Habitat

under this alternative). If acreage beyond this is disturbed, companies would be required to improve other habitat for similar wildlife purposes. For raptors, a "no surface occupancy" stipulation would apply to raptor nest sites as under Alternative C. However, the time periods for closure would be the same as those identified under Geophysical Exploration in this alternative. The maximum buffer zone would be one mile from the nest but may be reduced depending upon the topography.

Generally, no surface disturbance would be allowed within 500 feet from live water, on slopes in excess of 40 percent, or in wet meadows or subirrigated areas. These types of management practices would be oriented towards preventing soil and habitat loss while allowing development of the oil and gas resource.

APDs and access roads in landslide-prone areas and H₂S stipulations would be handled as described in Alternative B. Careful consideration would be given to approving actions which could be sources of H₂S in areas of poor dispersion, especially when they coincide with areas of geologic hazards.

In areas of sensitive resource values or high probability of transport into residential areas, the operator may be required to establish onsite monitoring of windspeed, direction, and atmospheric stability. The goal of this monitoring would be to provide real time meteorologic data for dispersion analysis should an accidental H₂S release occur. The operator in these areas may also be required to submit information on "Expected Calculated Absolute Open Flow" from the well(s) along with expected or real H₂S gas stream concentration so that an emission factor could be calculated quickly during an accidental release event. In these areas, the operator may be required to conduct real time dispersion analysis to aid in area evacuations or other actions to avoid loss of life or property during an uncontrolled H₂S release.

SOILS

Evaluation and interpretation of soils would continue as under Existing Management.

Reclamation (Issue 3)

All rights-of-way for pipelines, roads, and power and communication lines would be reclaimed except those roads left intact for

ALTERNATIVES

access purposes. Placement of topsoil, seeding, and stabilization would be required on cut, fill, and ditches on roads left intact. Reclamation of abandoned roads would include reshaping, recontouring, resurfacing with topsoil, installation of water bars, and drill seeding on the contour. These disturbances would not be fertilized or fenced but additional erosion control measures (e.g. fiber matting) may be required. All stripped vegetation would be spread over disturbance for nutrient recycling, where practical. On all areas to be reclaimed, seed mixtures would be site-specific and would consist of several species (various grasses and/or forbs) for soil stability, livestock palatability, and wildlife habitat. Sites may require inter-seeding, secondary seeding, or staggered seeding to accomplish this diversified goal. Temporary disturbances which do not require major excavation (e.g., pipelines and communication lines) may be stripped of vegetation to mineral soil using mechanical treatment, leaving topsoil intact. This would leave the root mass relatively undisturbed allowing for expedient revegetation and effective erosion control.

On well pads and larger locations, the Surface Use Plan would be reviewed. Special attention would be given to Point 10 of the surface use plan covering plans for reclamation and restoration of the surface. The format and content outlined in Appendix C would be an optional format for satisfying the requirements of Point 10.

On abandoned locations, the operator would recontour, resurface with topsoil, construct erosion and runoff control measures. If needed to produce adequate germination and growth, the topsoil would be reinoculated with soil micro-organisms and seeded. Fertilization may be necessary if there is evidence of nutrient deficiency. Seeding would be done first to stabilize soil (various grasses and forbs) and then to obtain the return of desired vegetation density and diversity. Species would be determined by location and may favor either wildlife, watershed, or livestock. The site would be drill seeded or broadcast (if slopes exceed 30 percent or 35 percent surface rock content), then mulched, and fenced. Fencing would remain until reclamation is successful. Successful reclamation would be anticipated within four years.

Disturbances in areas receiving 10 inches or less of annual precipitation may require snow fences placed to increase snowfall depth over reclaimed area and reshaping to create very shallow depressions to catch surface runoff.

On producing locations, unused pad portions would have all slopes reduced to original contours not to exceed 3:1 slopes, and would be resurfaced with topsoil, water barred, seeded with soil stabilizing species, mulched, and fertilized if needed. This may require bringing in additional topsoil.

Because wildlife habitat would be taken out of production, offsite mitigation may be required (see Issue 5).

Any weed problems which develop on either producing or abandoned locations would be controlled by the operator through mechanical or chemical means in accordance with the designated noxious weed control EA.

Slope limitation on development would continue to be those shown in Alternative B.

LIVESTOCK MANAGEMENT (Issue 4)

Grazing Preference

Forage would be produced for livestock grazing and, at the same time, other resource values would be protected and enhanced. The overall objective would be to improve range condition on "I" category allotments and to prevent declining conditions on all other allotments in order to maintain a total active grazing preference of approximately 162,000 AUMs. A long-term increase of 31,901 AUMs for a total of up to 193,901 AUMs would be realized through management actions shown on Appendix A-2.

Allotment Management Plans

New AMPs would be developed for 18 grazing allotments in approximately the order of priority shown in Table 2-2. Existing AMPs would continue to be followed on Willow Creek, Bench, Poison, Beaver Creek, and Rock Creek allotments until monitoring and evaluation indicate that a change in management is appropriate.

Range Improvements

New range improvements (Appendix A-2) would be authorized on "I" category allotments first. The "M" and "C" allotments would qualify as funding priorities allow. Maintenance of range improvements would be assigned to the benefitting user. Partial fencing may be required

ALTERNATIVES

on some reservoir developments to allow establishment of shoreline vegetation for wildlife. This alternative has a benefit to cost ratio of 1.65 and a present net value of \$1,030,690.

Forage Increases

Forage increases would be allocated to meet allotment objectives for all competing resources. In addition to providing for stability and growth in the livestock industry, forage increases would be allocated to meet the Wyoming Game and Fish Department's strategic plan for wildlife numbers as well as all applicable watershed and soils objectives.

Combining Allotments

The Cottonwood Bench and Lyman Cattle allotments would be proposed for combination. The Boyd Hollow and Christy Canyon allotments would be combined.

Rangeland Monitoring and Evaluation

The "I" category allotments would receive high intensity monitoring (climate, trend, utilization, and actual use). The "M" category allotments would be monitored at moderate intensity (climate, actual use, some trend, and utilization). Monitoring on "C" category allotments would be conducted at low intensity (climate, actual use, and limited utilization on selected key areas). Ecological site condition mapping would continue on "I" category allotments, solid block, and checkerboard lands in that order.

Vegetation Manipulation

Approximately 82,610 acres of vegetation manipulation have been proposed. No projects would be proposed in big game winter ranges or sage grouse nesting areas unless specific allotment objectives can be met.

Interagency Cooperative Management Plans

Cooperative plans with the Forest Service would be developed on the Trespass Creek, Hobble Creek, Pole Creek, and Inchauspe allotments.

Non-Alloted Public Lands

Approximately 4,500 acres of unalloted public land which support roughly 646 AUMs would be

made available for grazing. Some of these lands, however, could be disposed of through the Lands program.

Conversions in Kind

Livestock conversions would be approved only after a study (and accompanying EA) of the suitability for conversion had been completed. No conversions of sheep to cattle would be allowed in allotments with riparian problems without a plan to address riparian issues.

Riparian

Riparian issues would be addressed on all "I" category allotments with identified riparian problems. On "I" category allotments without grazing systems an objective would be established to set 60 percent as the maximum utilization level allowed on key riparian grasses. If utilization on allotments without a grazing system is measured at a higher rate, management changes would be required to reduce utilization to allowable levels. Such changes may include salting, herding, fencing, water development, conversion from cattle to sheep, or reduction in active preference.

Allotment Categorization

Same as in Existing Management.

Cooperative Management Agreements

Same as Existing Management. Current Bureau policy direction would determine the status of CMAs.

FISH AND WILDLIFE HABITAT (Issue 5)

This alternative would direct management actions towards maintaining or improving riparian habitat condition by minimizing impacts from seismic and oil and gas activity in or near the riparian zone through the use of avoidance; crossing on temporary or permanent bridges or culverts, reclamation to promote native riparian vegetation; or offsite mitigation. Logging and road construction would be addressed on a site-specific basis in the Timber Plan or EA and would consider wildlife/riparian values. Bridges would be recommended on all perennial stream

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crossings. Existing grazing practices would be continued on all “M” and “C” category allotments, unless monitoring showed riparian condition to be declining (see Livestock Management). Utilization of key riparian grasses would be set at a maximum of 60 percent in all “I” category allotments with identified riparian problems (Appendix A-5). These allotments would be monitored at least every two years and grazing pressure on the riparian area would be removed if the 60 percent level would be reached at any time. This stipulation would be required as a “term and condition” of permits and leases in all identified allotments. Stream channel stability, erosion, sedimentation, and riparian vegetation condition would be monitored in selected “I” allotments. No conversion of sheep to cattle would be allowed in any allotment with declining riparian condition, unless this action would reduce the rate of the decline.

Management of the Raymond Mountain ACEC would be similar to that described under Alternative C, mineral development would be allowed but mitigation measures would be required to protect the fisheries resource. A “no surface occupancy” stipulation would be applied to a ¼-mile buffer zone around all perennial creeks in the ACEC area. The current Raymond Canyon road closure would remain in effect.

Four new HMPs would be prepared and implemented: Woodruff Narrows, Cumberland Wetlands, Overthrust, and Kemmerer Riparian. Proposed management actions would reflect a balanced approach without significantly affecting other resource use over a large area.

No wildlife habitat would be withdrawn from mineral development (see Minerals). The “no surface occupancy” stipulation would be applied to the Woodruff Narrows and Morgan Canyon bald eagle winter roost sites (Map B). Seasonal stipulations and special reclamation measures would be required in all important wildlife habitat (see Issues 1-3). Offsite mitigation would be required for all surface disturbance in the most important mule deer and elk crucial winter range (Special Wildlife Areas 1-5 on Map B). In these areas, which total less than 5 percent of the KRA, a stipulation would be added to the lease requiring the developer to fund offsite habitat improvement at a cost based on the acres of effective habitat disturbed. Project details and costs per acre of surface disturbance would be outlined in the APD or EA and could include burning, fertilization, or other enhancement methodologies. For all other big game crucial winter range and sage grouse nesting areas (Map B), a threshold of 10 percent

effective habitat loss would initiate future offsite mitigation measures as outlined above. The 10 percent level would be based on the total available crucial winter range by Herd Unit for big game, or the total available nesting habitat for sage grouse. Effective habitat is defined as all acres of surface disturbance plus a buffer zone around disturbance to be figured as 1-mile radius for elk and moose, and ½-mile radius for mule deer and antelope. All open roads, well pads, and other disturbance facilities would be considered in determining the percent effective habitat disturbed. If a 10 percent threshold is reached, a road plan would be developed for the entire crucial winter range to minimize road densities where possible.

Except for the main access road to Nugent Park, all roads north of the Pine Creek Road intersection on Dempsey Ridge would be permanently closed to protect elk calving areas and watershed values. On a case-by-case basis, the Rock Creek and Slate Creek elk winter ranges would be closed to public snowmobile use from December 1 to May 1 to minimize stress on wintering elk.

Sage grouse restrictions would be flexible and would apply to the lek site. This would be the same as in Alternative C.

If stipulations to protect wildlife are not in the lease and they are needed to protect wildlife, such conditions would be added to APDs in the most important parts of the crucial winter range (Map B).

Bridges or culverts would be required for equipment crossings on perennial streams. The bridges or culverts would be required to provide for fish passage.

RECREATION (Issue 6)

Recreation Potential

Recreation potential would be managed for preservation of the recreation base. Roads to well pads may be used as recreation access or they may be routed to avoid high recreation potential sites.

No recreational developments would be anticipated for the near future, however, as budget constraints are reduced, development should proceed in the Raymond Mountain Area, Pine Creek, Dempsey Ridge, Commissary Ridge, Upper Hams Fork, and Upper Smith's Fork areas. Three RAMPs would be developed for prime areas of recreation potential as in Alternative C.

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Same as Alternative C except that the road closure on the Sublette Trail (Commissary Ridge area) would be decided upon during the field season. Also, the Slate Creek elk winter range snowmobile closure would be implemented only after a year-by-year analysis to determine need. Most of the KRA (1,600,054 acres) would be designated "limited" with closures in Raymond Mountain and Sliderock Trail. BLM/Forest Service boundaries would have matching designations. Snowmobile use would remain open except in the Rock Creek area for wintering elk. Total acreage closed would depend on the site-specific decision described above.

Raymond Mountain WSA

Same as Alternative C.

LAND RESOURCES

Land Tenure Adjustment (Issue 7)

Land tenure would be as described as in Existing Management. Several methods of land tenure adjustment would be considered (53,467.74 acres have been identified for disposal).

The priority area of the KRA would be the 3,800 acres of BLM land in Star Valley. The BLM parcels adjacent to the National Forest boundary would be transferred to the Forest Service for management. Presently, an MOU is being drafted to administratively transfer management to them. Because Congressional action is required to formally adjust the Forest Service boundary in Star Valley, an MOU would effectively transfer management to the Forest Service until Congressional action is taken.

Other parcels in Star Valley would be disposed of by sale, R&PP lease or patent, or exchange. There are presently two R&PP applications, one sale request, and one tentative exchange proposal in Star Valley. These land tenure adjustment actions would take place after completion of an environmental analysis/land report and publication of a classification decision or a NORA.

Other public lands in the remainder of the KRA (Appendix D) would be sold upon completion of a site specific EA/Land Report and publication of a NORA. The disposal actions would comply with present policy as detailed in FLPMA and

BLM manuals and regulations. Exchanges, R&PPs, and other land tenure adjustment actions would take place on a case-by-case basis as the public needs are identified.

Rights-of-Way (Issue 8)

Rights-of-way would continue to be processed as described under Alternative A except that waivers to seasonal stipulations would be considered on a case-by-case basis.

Threatened and endangered species habitat and known raptor nesting sites would be designated for "no surface occupancy." A right-of-way would be routed around these areas (Map B). Crucial wildlife habitat areas would be designated as "minimal access areas." Seasonal restriction on crucial wildlife habitat could be waived by the Area Manager with staff input.

To facilitate revegetation of rights-of-way, sites would be fenced (where feasible) to prevent livestock grazing from impacting new vegetation. Attempts would be made to block linear rights-of-way to vehicle use.

On existing communication sites, pre-FLPMA rights-of-way would be converted to FLPMA rights-of-way with subgranting rights with the concurrence of the right-of-way holder. Secondary users would be authorized by the primary holder subject to compliance with all applicable laws and regulations.

Access (Issue 9)

High priority areas for access acquisition would be the Meeks Cabin area in support of the forestry program. Access to Raymond Mountain should be priority as well. Other needs would be identified as site specific management plans become available.

During oil and gas operations, a road would be considered for long term support of all programs. As described in other alternatives, access would be acquired across private lands if a program need is identified. If a multiple use decision is made to have the road restored, it would be reclaimed.

FIRE MANAGEMENT

Same as Alternative A.

CHAPTER III

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter summarizes physical, biological, social, and economic characteristics of the environment of the Kemmerer Resource Area (KRA). More detail is provided for the components of the environment that may be impacted by the alternatives. Existing information was used from the Pioneer Trails Unit Resource Analysis, the Socioeconomic Profile of the District, and recent reports from industry and government. Information available from the Overthrust Industrial Association, Petroleum Information Inc., and recent EISs completed on Overthrust minerals activity was also used.

There are no wild or scenic rivers, no sole sources of drinking water, or no prime and unique farmlands in the area. Wetlands, floodplains, areas of critical environmental concern, and threatened and endangered species are present. They are described, as appropriate, to set the stage for potential impact discussion.

SETTING

The KRA includes the cities of Kemmerer and Evanston and surrounding areas of southwestern Wyoming; the Star Valley area to the north; small portions of Bear Lake County, Idaho; and a part of Rich County, Utah. The areas outside of Wyoming are managed for range resources only, by agreement with adjacent BLM offices in Utah and Idaho. The KRA is approximately 75 miles from east to west and 130 miles from north to south, excluding Star Valley. Public land surface administered by the BLM 1,633,130 acres constitute 51 percent of this area plus 204,000 acres of Federal mineral estate.

The area is semi-arid allowing the sagebrush-grass to dominate regional vegetation. Greater precipitation occurs at higher elevations, supporting stands of pine, fir, and aspen. The topography ranges from rolling hills and buttes in the east to high mountains and escarpments in the west caused by Overthrust faulting. Elevations range from 6,100 feet in the valleys to over 8,500 feet in the mountain foothills.

The region has traditionally been sparsely populated. Ranching and coal mining formed the early history of the area. In the latter half of this century, trona mining and oil and gas exploration and development have changed populations, life styles, economics, and the regional outlook.

CLIMATE AND AIR QUALITY

Climate

The climate of the KRA is classified as dry, midcontinental. Most precipitation is of Pacific origin. Due to a short growing season and limited rainfall, agriculture is mainly centered about livestock grazing. The KRA is dry during most of the year. Average annual precipitation for the KRA ranges from about 9.33 inches to 18.44 inches. Approximately 38 percent of the precipitation occurs as rainfall from April to June. During the winter, gusty winds may produce ground blizzards and drifting snow. The frost-free season is only about 60 to 70 days. The KRA generally has clear, sunny days (approximately 252 per year) with high evaporation rates. Monthly average relative humidity ranges from about 35 percent in July to about 75 percent in December. These statistics explain the scarce occurrence of natural free-standing surface water. Springs and wells have been developed to supplement these scarce supplies of water.

Air temperatures also have a great influence on activities. Temperatures are frequently below 0°F in winter and range above 90°F in summer. The annual mean temperature is 38°F. Extremes in temperature, ranging from 102°F in summer to -60°F in winter, were recorded at Border, Wyoming.

Winds are strong and mostly from the west-southwest. Figure 3-1 is a combination contour map and wind velocity vector plot for southwest Wyoming. This figure depicts wind speed and direction for the most common wind regime in the area. Figure 3-2 depicts wind vectors for the worst case F stability (poorest atmospheric mixing) wind in the area. Long-term wind patterns, combined with atmospheric stability and mixing height, greatly influence transport of pollutants and explain inversion events. No data for the

AFFECTED ENVIRONMENT

frequency of inversion events exists for the KRA.

Dispersion potentials for the KRA are shown in Map A. This map illustrates the areas where, if pollutants were released (i.e., sour gas well blowout), they would not readily disperse or mix with the atmosphere. Map A was produced using stable atmospheric conditions and low wind speeds to depict realistic but worst case conditions. As can be seen, dispersion of pollutants in the KRA even under extreme conditions is reasonable.

Air Quality

Air quality in the KRA is generally very good with low ambient concentrations of pollutants (Table 3-1) and background visibility at about 170 kilometers. The KRA has been designated as Class II under the Wyoming Department of Environmental Quality's (WDEQ) approved State Implementation Plan. Class II areas are those which may be industrialized with release of certain pollutants up to specified concentration (Table 3-2), called increments, over the ambient level. State and Federal pollutant concentration standards which apply are listed in Table 3-2.

Table 3-1
ESTIMATES OF REPRESENTATIVE
BACKGROUND (EXISTING)
POLLUTANT LEVELS IN THE
KEMMERER RESOURCE AREA¹
(micrograms/cubic meter)

Pollutant	Background Averaging Time	Concentration
SO ₂	3-hour	70
	24-hour	15
	Annual	3
NO ₂	Annual	9
TSP	24-hour	60
	Annual	30
CO	1-hour	3,500
	8-hour	1,500

¹ Background pollutant levels estimated from available data sources. Sources include WDEQ monitors at Kemmerer, Grover, and Boulder; Amoco monitors at Ryckman Creek; Utah Power and Light monitors at the Naughton Power Plant; and monitors operated by Kemmerer Coal Company.

Major sources of air pollution are listed in Table 3-3. Major emission sources in Wyoming must not produce concentrations of air pollutants beyond either the Class II increments (or the Class I increments in Class I areas) or the Wyoming Ambient Air Quality Standards. At present, no areas of violation (non-attainment) exist within the KRA.

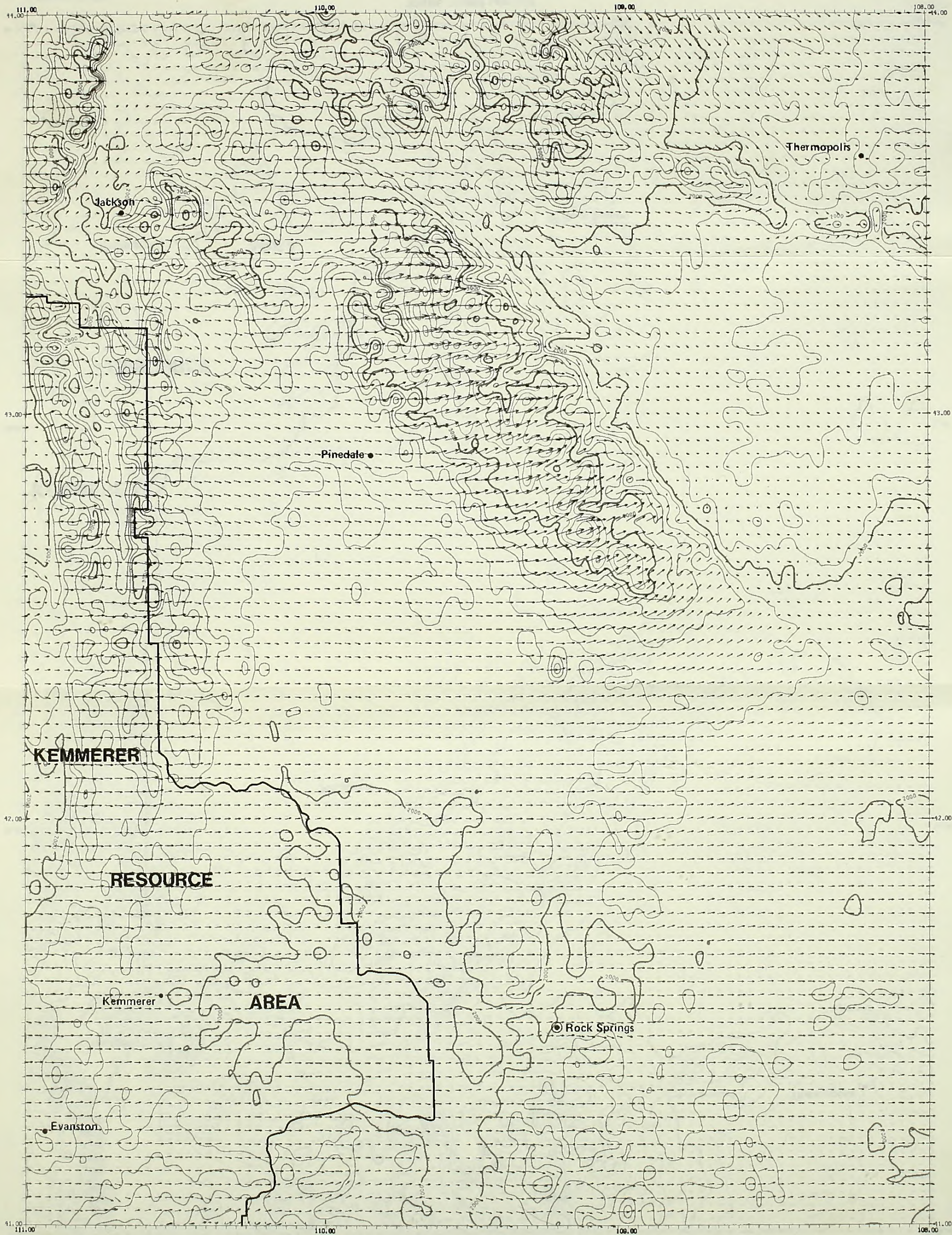
Acidic deposition (acid rain) monitoring data are reported for Pinedale, Wyoming (Table 3-4). This site, part of the National Atmospheric Deposition Program (NADP), collects background precipitation data and should be representative of the KRA.

Throughout the Overthrust area of western Wyoming, natural gas wells with high concentrations of hydrogen sulfide (H₂S) have been encountered. Natural gas from these wells, sour with H₂S, must be cleaned or "sweetened" at specialized plants. These sweetening plants, sour gas pipelines, and wells can pose danger to the public, livestock, and wildlife through accidental release of H₂S. Sources of H₂S in the KRA and surrounding areas are shown on Map A. The WDEQ standards for H₂S concentrations and exposure data are given in Table 3-5. Modeled wind fields for the Rock Springs District have been combined to depict the general dispersion regimes for the area. For the most common wind speeds and directions, a composite is included to delineate areas of poor dispersion (areas where pollution may be trapped in slow moving air).

GEOLOGY

The KRA extends over parts of two geologic provinces, the Overthrust Belt (Map 9) and the Green River Basin (Map 10). Both contain important mineral resources.

The Overthrust Belt is part of a zone of intense structural deformation extending from Canada to Mexico (Ver Ploeg, DeBruin, 1982). It occupies roughly the western half of the KRA. Deformation occurred during late Jurassic, Cretaceous, and Paleocene geologic times, when a series of north-south trending thrust faults developed, resulting in displacement and folding of the Paleozoic and Mesozoic sediments accumulated until that time. The major thrust faults are the Darby, Absaroka, and Crawford thrusts. Following the period of thrusting, high-angle normal faults developed, similar to faulting in the Basin and Range province to the west. Some of those faults are still active (Blackstone, 1977). The Rock Creek fault west of Kemmerer is an example of a normal fault which

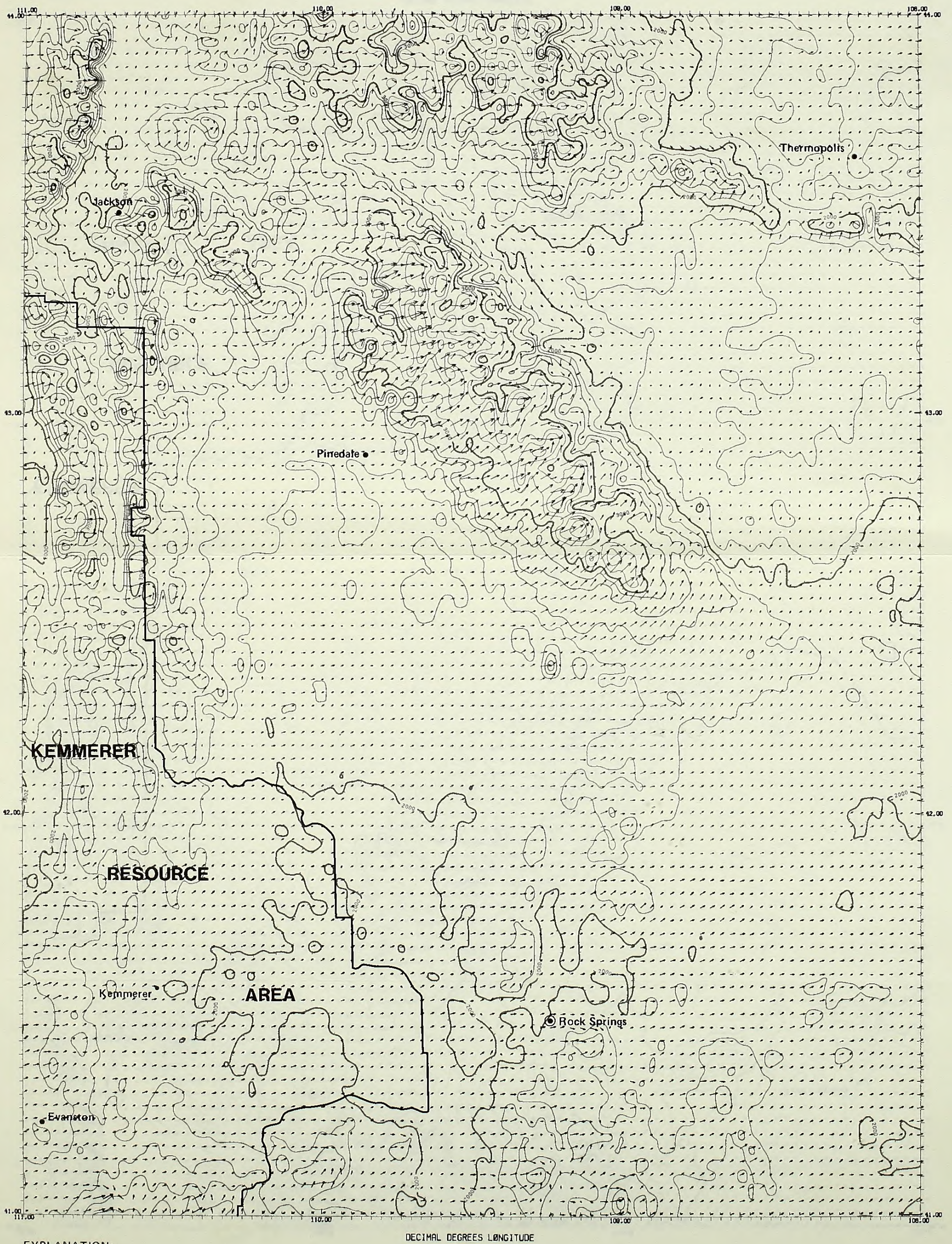


EXPLANATION:

Velocity Vector Plot
 Influencing Wind W at 7 M/S
 All Stabilities
 S.E. Corner Coordinates 41° 00' by 108° 00'
 N.W. Corner Coordinates 44° 00' by 111° 00'
 Grid Dimensions X=91, Y=91
 Grid Spacing at 2-minute Intervals
 2-minute (X Axis) = 2.732 K
 2-minute (Y Axis) = 3.706 K

Figure 3-1
AIR QUALITY
ALL STABILITIES
 Kemmerer Resource Management Plan

DECIMAL DEGREES LATITUDE

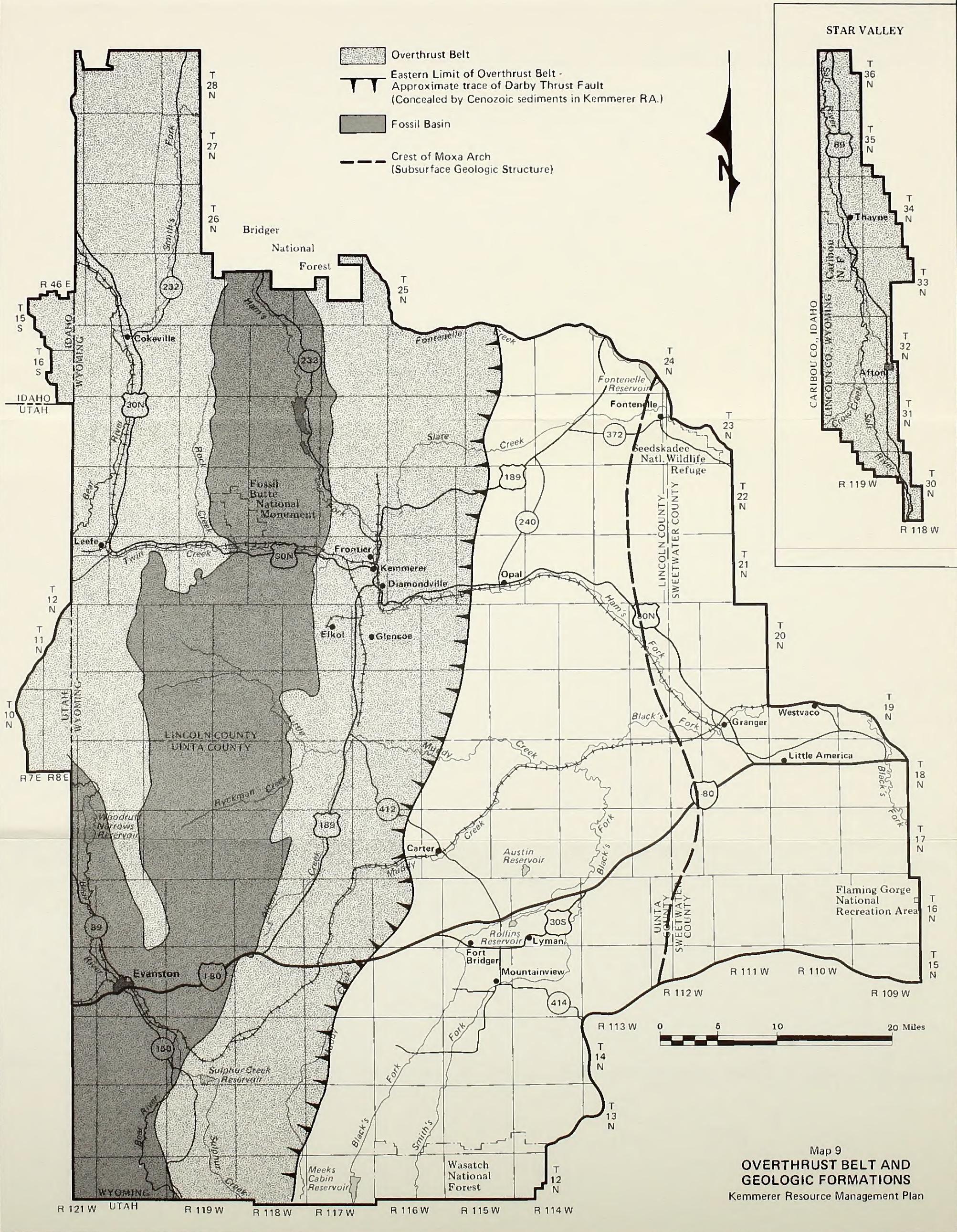


DECIMAL DEGREES LONGITUDE

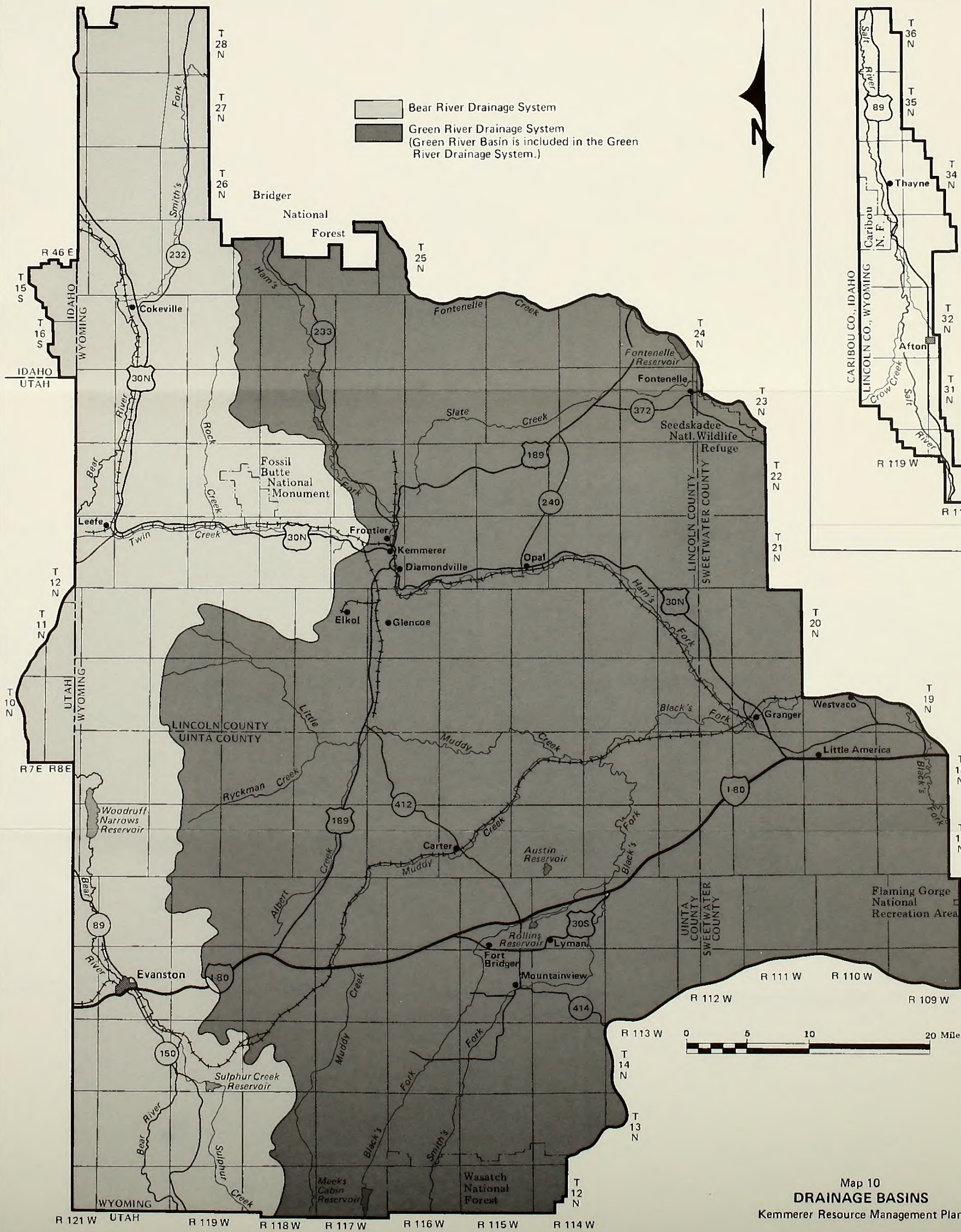
EXPLANATION:

Velocity Vector Plot
Influencing Wind WSW at 2.5 M/S
F-Stability
S.E. Corner Coordinates 41° 00' by 108° 00'
N.W. Corner Coordinates 44° 00' by 111° 00'
Grid Dimensions X=91, Y=91
Grid Spacing at 2-minute Intervals
2-minute (X Axis) = 2.732 K
2-minute (Y Axis) = 3.706 K

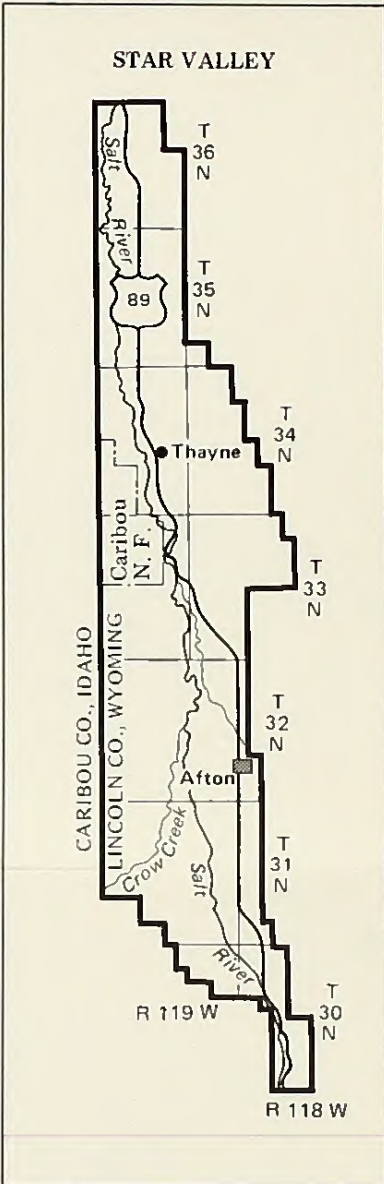
Figure 3-2
**AIR QUALITY
F-STABILITY**
Kemmerer Resource Management Plan



Map 9
**OVERTHRUST BELT AND
GEOLOGIC FORMATIONS**
Kemmerer Resource Management Plan



Bear River Drainage System
 Green River Drainage System
 (Green River Basin is included in the Green River Drainage System.)



Map 10
DRAINAGE BASINS
 Kemmerer Resource Management Plan

Table 3-2
STATE AND FEDERAL AIR QUALITY STANDARDS
(micrograms/cubic meter)

Pollutant	Averaging Time	Ambient		Wyoming State	Increment		
		Federal			Federal & Wyoming		
		Primary	Secondary		Class I	Class II	Class III
Sulfur Dioxide (SO ₂)	Annual (Arith.)	80	—	60	2	20	40
	24 hour	365	—	260	5	91	182
	3 hour	—	1,300	1,300	25	512	700
Total suspended Particulates (TFS)	Annual (Geom.)	75	60	60	5	19	37
	24 hour	260	150	150	10	37	75
Carbon Monoxide (CO)	8 hour	10,000	10,000	10,000	—	—	—
	1 hour	40,000	40,000	40,000	—	—	—
Non-Methane Hydrocarbons	3 hour (0600-0900)	—	—	160	—	—	—
Hydrogen Fluoride 24 hour (HF)	—	—	0.3	—	—	—	—
Hydrogen Sulfide (H ₂ S)	long-term*	—	—	70	—	—	—
	short-term**	—	—	40	—	—	—
Lead (Pb)	Quarterly	1.5	1.5	—	—	—	—
Nitrogen Dioxide (NO ₂)	Annual (Arith.)	100	100	100	—	—	—
Oxidents (Ozone)**	1 hour	235	235	160	—	—	—

SOURCES: National Primary and Secondary Ambient Air Quality Standards (40 CFR 50 *et seq.*, as amended January 5, 1983). Requirements for Preparation, Adoption and Submittal of Implementation Plans (40 CFR 51.24, as amended September 3, 1982). Approval and Promulgation of Implementation Plans (40 CFR 52.21, as amended June 25, 1982). Code of Colorado Regulations (Volume 5, Part 14 as amended May 27, 1980). Wyoming Rules and Regulations of the Department of Environmental Quality, Air Quality Division, (Chapter 1 as amended January 25, 1979).

* The Wyoming long-term hydrogen sulfide half-hour standard is not to be exceeded more than twice per calendar year.

** Short-term standards (those other than Annual and Quarterly) are not to be exceeded more than once each year, except hydrogen fluoride, hydrogen sulfide, and the Federal ozone standards. Under Federal regulations, the "expected number of days" with ozone levels above the standard are not to be exceeded more than once per calendar year. The Wyoming short-term hydrogen sulfide half-hour standard is not to be exceeded twice per five day period.

AFFECTED ENVIRONMENT

Table 3-3
EMISSIONS FOR EXISTING SOURCES IN THE STUDY AREA
(pounds/hour)

Emission Source	Emissions		
	SO ₂	NO _x	TSP
Naughton Power Plant (Allowable) ¹	5,894	5,018	1,517
Opal Gasoline Plant	0	150	0
Opal Compressor Station	0	16	0
FMC Coking Plant	NA	NA	139
Kemmerer Coal (Allowable) ¹	0	0	269
Dehydrators	NA	65	NA
FMC Trona Plant	806	820	330
Texas Gulf Trona Plant	203	381	240
Stauffer Trona Plant	20	153	175
Tenneco Trona Plant	226	791	NA
Whitney Canyon Gas Treatment Plant ²	3,117	0	0
Carter Creek Gas Treatment Plant ²	34	0	0
Amoco Production Company	NA	NA	NA
Southland Jones	NA	NA	NA
Wasatch Forest Products	0.23	6	19
Kamus Forest Products	NA	NA	NA
FMC, Skull Point Mine	NA	NA	NA

NA No data available.

¹ Allowable emissions refer to the maximum emission rate permitted by regulation. Actual plant emissions are generally below these levels.

² These sources have only recently begun operation. Their emissions, therefore, have not contributed to historic air quality measurements.

SOURCE: Riley Ridge Natural Gas Project Air Resources Technical Report, BLM 1983.

may be considered active. During late Cretaceous time, a structural basin began forming within the Overthrust Belt. The basin, now called Fossil Basin, received a wide variety of continental and lacustrine sediments. The lacustrine deposits of the Green River Formation contain some of the best preserved vertebrate fossils in the world (Oriol and Tracey, 1970). The faulted and folded strata of the Overthrust Belt contain many structural traps for hydrocarbons in the subsurface, as revealed by large, deep discoveries of oil and gas around Evanston, Wyoming. Coal, phosphate, oil shale, bentonite, uranium, and gravel are other mineral resources found in the Overthrust portion of the KRA. The rugged topography of the Overthrust, consisting predominantly of north-south trending ridges, has complicated the extraction of the mineral resources, particularly coal, and oil and gas.

The Green River Basin is geologically quite different from the Overthrust. It formed as a structural depression beginning during the early Tertiary geologic time as a result of crustal downwarping. The basin filled with sediments from surrounding mountain ranges, including the Uintas, the Wind Rivers, and the Overthrust Belt. During the downwarping of the Green River Basin in Eocene time, a lake formed. Lake Gosiute, as it is now known, lasted 4 to 8 million years, fluctuating both in size and in salinity. An evaporite mineral called trona was deposited over broad areas during certain stages of the lake's history, along with oil shale and uranium (Sullivan, 1980). The Green River Basin also contains deposits of oil and gas. Large concentrations of hydrocarbons are associated with a subsurface structure called the Moxa Arch, a broad arch in the subsurface sediments running from the Uinta Mountains northerly to the Big Piney-LaBarge gas fields.

AFFECTED ENVIRONMENT

Table 3-4
RAINFALL pH DATA
FROM PINEDALE, WYOMING,
NATIONAL ATMOSPHERIC
DEPOSITION PROGRAM
(NADP) SITE

Month/Year	Number of Observations	Mean pH
1982		
August	5	5.28
September	3	5.53
October	3	5.99
November	4	5.51
December	4	5.79
1983		
January	1	6.08
February	4	5.99
March	5	5.72
April	4	6.09
May	5	5.45
June	4	4.64
July	3	5.01
August	4	5.24
	49	5.56

SOURCE: NADP Central Analytical Laboratory -
Illinois State Water Survey

MINERALS

Oil and Gas

Oil and gas reserves in the KRA have been the focus of industry interest over the last thirty years. During the 1970s interest increased and from October 1979 to September 1983, about 4,400 miles of seismograph line were run in the area (Map 4). Virtually the entire resource area is leased.

Oil from springs and seeps was first reported in the southwestern corner of the KRA as early as 1848, some of which was used by emigrants moving through the area. This oil, as in other early "discoveries", was produced from oil seeps or springs. In 1900, oil was produced from a water

well drilled near some of the oil seeps, and as a result, about 200 wells were eventually drilled in the Spring Valley-Aspen-Sulphur Creek area, producing a total of about 250,000 barrels of oil from shallow fields (Ver Ploeg and De Bruin, 1982).

The next successful exploratory efforts in the KRA took place in the Green River Basin along the Moxa Arch, starting with the Church Buttes field in 1956 (Wyoming Oil and Gas Commission, 1982). Numerous fields have since been developed along the Moxa Arch (Map 9).

Although wildcat wells were drilled in the Overthrust Belt prior to 1975, the "boom" in drilling began with the discovery of Utah's Pineview field in 1975, followed by Wyoming's Ryckman Creek field in 1976. Since then, intense exploration, consisting of seismic and drilling programs, has resulted in major discoveries of oil and gas in the so-called "fairway" of the Overthrust Belt (Ver Ploeg and DeBruin, 1982). An extremely important factor in the success of oil and gas exploration in the Overthrust Belt has been improvements in geophysical techniques and processing of data, enabling companies to decipher more clearly some of the very complex, deep structures in the subsurface which trap oil and gas. As a result of technological advances in the industry, geophysical lines are often re-run over the same area to obtain higher quality data. Also, different companies often run lines in the same areas. The result is that geophysical lines are often duplicated many times (Map 4). There are currently about a thousand miles of seismic lines run in the Overthrust area each year.

At the end of 1982, forty-three oil and gas fields in the KRA were recognized by the Wyoming Oil and Gas Commission (Appendix B-3, Map 11). Several of the older fields are abandoned. Total production from the fields in 1982, some of which fall partly outside the KRA, was about 7,249,000 barrels of oil, and 77,036,000 thousand cubic feet of gas. There were over 300 producing wells (Wyoming Oil and Gas Commission, 1982). When drilling was at its peak, about 70 wells were drilled annually in the KRA. Currently, about 40 wells are drilled annually.

The U.S. Geological Survey estimated that the Utah-Wyoming-Idaho portion of the Overthrust Belt contains undiscovered recoverable reserves of 6.7 billion barrels of oil and 58.4 trillion cubic feet of gas (Petroleum Information, 1981). In 1980, Amoco estimated the discovered potential reserves of five Overthrust fields (Table 3-6). Those estimates involve less speculation than the USGS undiscovered recoverable reserve estimates.

AFFECTED ENVIRONMENT

Table 3-5
SUMMARY OF THE TOXIC EFFECTS OF H₂S
ON HUMANS, BASED ON ANIMAL STUDIES
AS WELL AS ACTUAL EXPOSURES TO MAN

Concentration ¹ (by vol.)		Seconds	Exposure Time in Effect
ppm	mg/m ³		
2000 ²	2,880	3 - 10	Respiratory arrest, unconsciousness, pulmonary edema, or death
500 - 1000 ²	720 - 1,440	3 - 120	Respiratory arrest, unconsciousness, pulmonary edema, or death
250 ³	360	1,220	Unconsciousness
150 - 250	216 - 360	—	Olfactory paralysis
50 - 300	72 - 432	3,600	Eye irritation
100	144	—	Neurasthenic disorders
0.005	0.007	—	Median odor threshold

SOURCE: Accidental Releases of Sour Gas from Wells and Collection Pipelines in the Overthrust Belt: Calculating and Assessing Potential Health and Environmental Risks (Draft); Lawrence Livermore National Laboratory (April 1983).

¹ For a pressure of 1 atm and a temperature of 60° F.

² Animal data.

³ Based on one incident.

The BLM received an analysis of the oil and gas potential of various parts of the KRA from Atlantic Richfield Company. The Atlantic Richfield report rated the entire KRA as high potential. Marathon Oil Company nominated the Raymond Mountain WSA as an area of critical mineral potential for oil and gas. This coincides with the Bureau's assumption in this RMP that any part of the KRA has the potential to be developed for oil and gas.

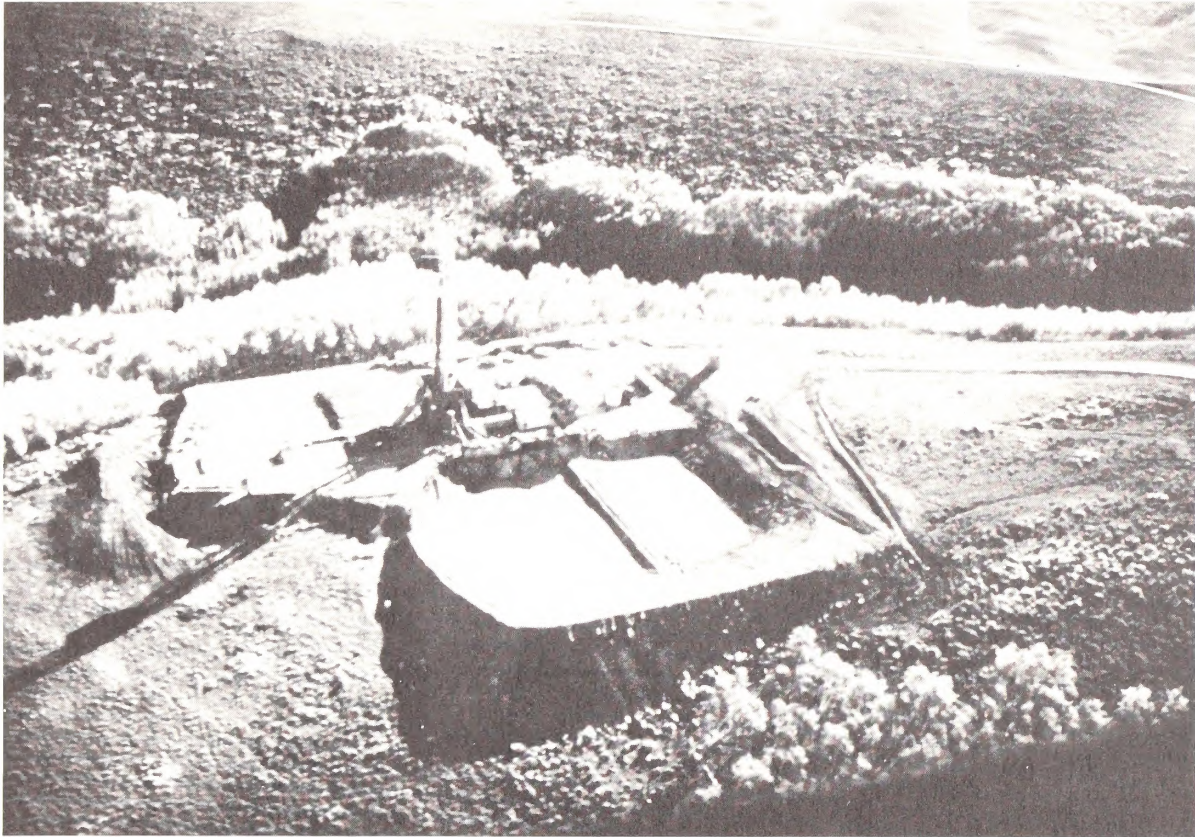
An important factor in the development of the Overthrust Belt and Green River Basin fields has been the production of "sour" gas, which is natural gas containing relatively high percentages of hydrogen sulfide. In the Green River Basin, the Church Buttes, Butcher Knife Springs, and Bruff fields produce sour gas from the Morgan Formation. The following Overthrust fields in the KRA contain significant amounts of sour gas: Yellow Creek (Nugget, Phosphoria, and Weber Sandstone formations), Red Canyon (Phosphoria Formation), Woodruff Narrows (Bighorn Dolomite Formation), Session Mountain (Madison and

Bighorn Dolomite formations), Whitney Canyon/Carter Creek (Madison and Bighorn Dolomite formations), and Road Hollow (Bighorn Dolomite Formation).

Coal

Coal has been mined in the KRA since the late 1800s in the Kemmerer and Evanston areas. Gradually, the underground mines closed, in part because of a reduced demand as a result of the conversion of railroad locomotives from coal to diesel fuel.

Surface coal mining began around 1950 in the Kemmerer area, and has continued to the present. Two surface mines are operating: the FMC Skull Point Mine, and Kemmerer Mine (Map 12). The FMC Corporation has Federal coal leases on 3,200.08 acres, and anticipates that mining will continue until 1996. Twenty million tons of Federal and private coal reserves are projected to be mined



Wildcat deep test in northern Overthrust Belt portion of the KRA



Producing well site in the Green River Basin

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Table 3-6
DISCOVERED POTENTIAL RESERVES
IN THE IDAHO-WYOMING-UTAH
OVERTHRUST BELT

Fields	Gas Cu. Ft.)	Liquids (Billion (Million BBLs.))
Pineview, Ryckman Creek, Painter Reservoir, Clear Creek	600	147
Yellow Creek, Anschutz Ranch (Jurassic Production)	65	2
Carter Creek - Whitney Canyon	5,300	115
Cave Creek, Yellow Creek (Deep Production)	400	10
Painter Reservoir East, Anschutz Ranch East, Glasscock Hollow	3,460	640
Total	9,725	914

Source: Amoco Production Company. From Ver Ploeg and DeBruin, 1982.

between 1984 and 1996. Pittsburg and Midway Coal Company (P&M) has 6,084.81 acres under Federal lease. Together with private reserves, P&M anticipates mining between 4 and 4.5 million tons per year until the year 2000. A large portion of the coal is used by an adjacent electric generating plant.

Cumberland Coal Company has proposed a new surface mine south of the FMC Skull Point Mine. The new mine, South Haystack, would produce 65.9 million tons of sub-bituminous coal over a 22-year period. Uncertainties about marketing the coal have delayed the project. Two other proposed surface mines may eventually be started: the Twin Creek and North Block proposals west and north of Kemmerer. Timing of the start-up on these projects is uncertain.

Trona

Trona is a hydrous sodium carbonate mineral which can be refined into soda ash. The world's largest known deposit of trona is located in southwestern Wyoming. That deposit extends into the KRA. The Wyoming trona deposits account for almost 20 percent of world production of soda ash (BLM, 1981a). About 1.8 tons of trona are required to produce a ton of soda ash. Soda ash

is used in a wide variety of industrial applications. Glassmaking accounts for more than 50 percent of the consumption, the chemical manufacturing industry accounts for 23 percent, and other uses make up the rest.

Trona was discovered in the Kemmerer area in 1938. Since then, five underground mines with refining plants have opened in the area of the trona deposition (Map 12). Westvaco (now FMC Corporation) was the first in 1946, followed by Stauffer Chemical Company, Allied Chemical Company, Texasgulf Incorporated, and most recently, Tenneco, Incorporated. The Wilkens Peak Member of the Green River Formation includes at least 42 trona beds, occurring from 400 to 3,500 feet below the surface. Five beds are being mined (Culbertson, et al., 1980). Identified trona reserves are 114 billion tons, with more than 30 billion tons of salt-free trona in 13 beds that are six or more feet thick (U.S. Bureau of Mines, 1981). Production of Wyoming trona for the year ending September 31, 1982, was about 11,541,000 tons.

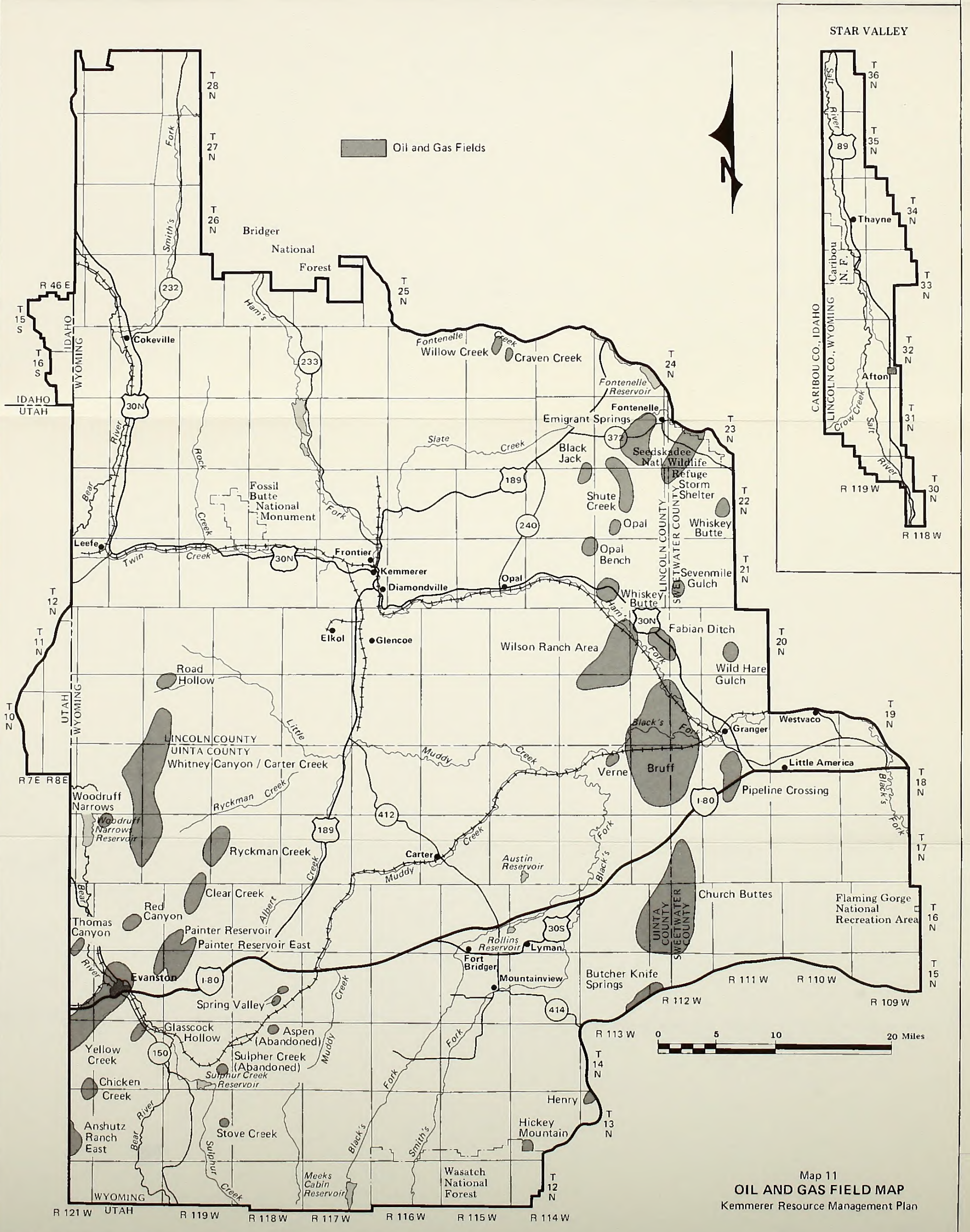
Roughly half of the area containing Federal trona is leased. BLM is proposing to start new leasing in 1985, using an experimental form of competitive leasing called concessionary leasing, as well as competitive leasing. This will be based on an approved amendment to the Pioneer Trails MFP. Using 1978 as a base, demand for soda ash is projected to rise at 1.8 percent per year through 1990.

Oil Shale

The Green River Basin contains an estimated 244 billion barrels of shale oil in the Tipton Shale, Wilkens Peak, and Laney members of the Green River Formation. This estimate is based on oil shale that yields at least 15 gallons of oil per ton of rock. The 15 gallons per ton figure is somewhat arbitrary, but it appears that oil shale of lower yield will not be mineable in the near future (Culbertson, et al., 1980).

Oil shale occurs throughout most of the Green River Basin, and in thin beds (less than 4 feet) in Fossil Basin. The only significant resources in the KRA are located toward the eastern edge of the area around Flaming Gorge Reservoir.

The richest beds are located around 15 miles northwest of the main area of the reservoir. Those beds in the upper part of the Tipton Shale are up to 75 feet thick and yield up to 24 gallons of oil per ton. Overburden, though, is 2,000 to 3,000 feet thick. The lower Tipton also contains



Map 11
OIL AND GAS FIELD MAP
Kemmerer Resource Management Plan

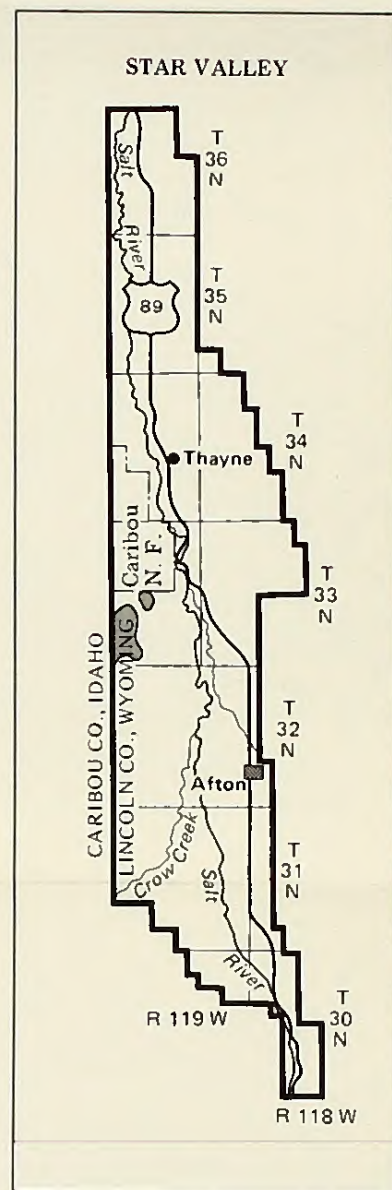
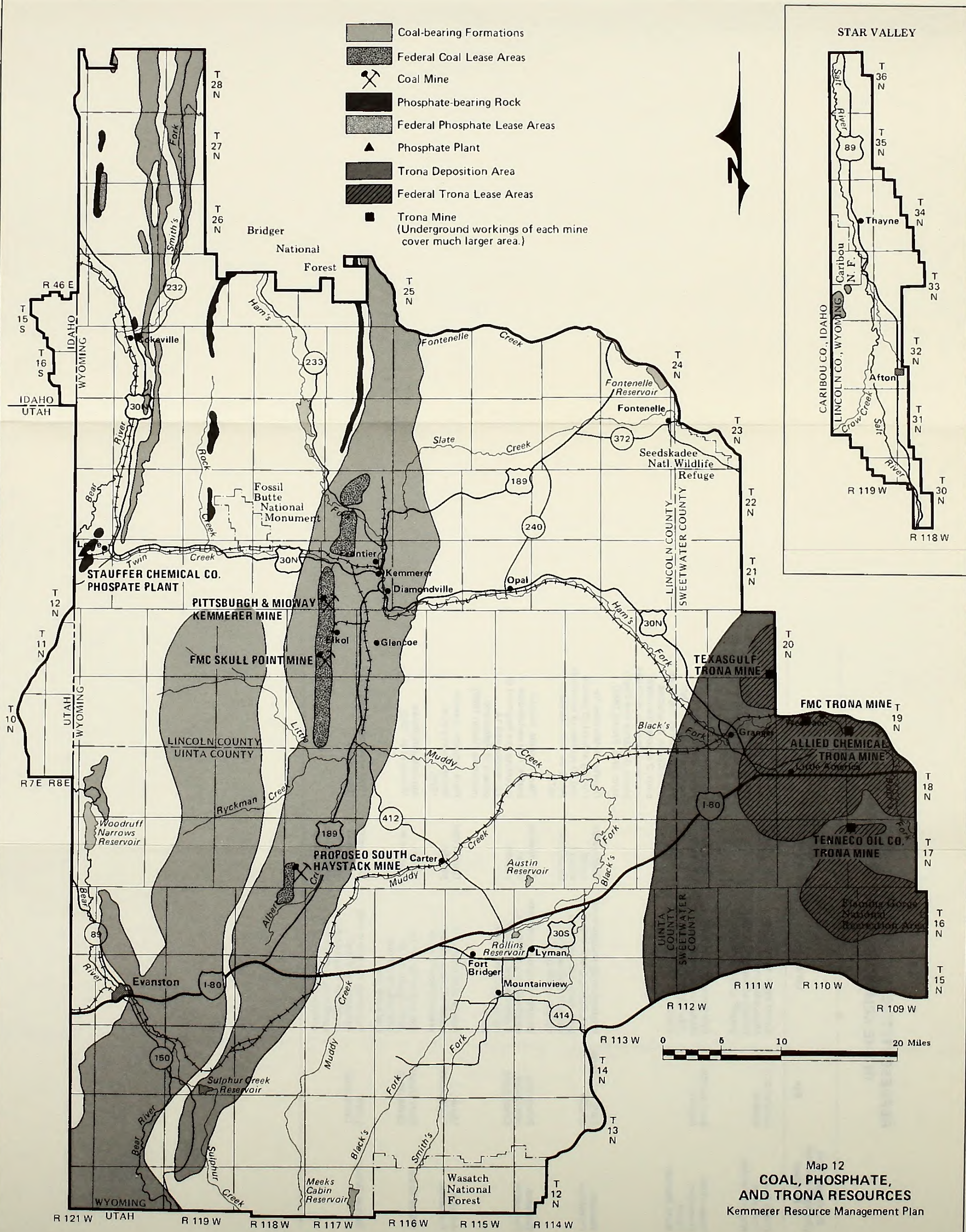
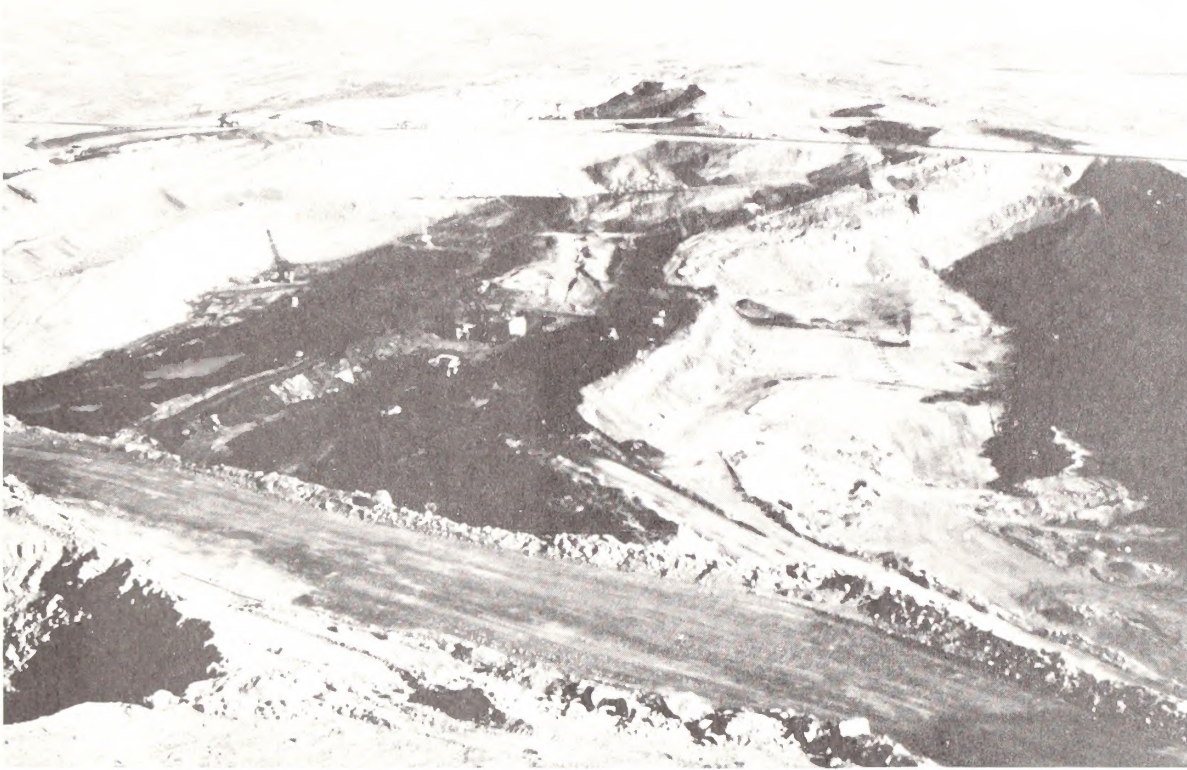


TABLE 3-7
REPRESENTATIVE FOSSIL-BEARING FORMATIONS
IN THE KEMMERER RESOURCE AREA

Geological Unit (Group, Formation or Member)	Age	Lithology	Environment of Deposition	Fossils
Green River Formation, Angelo Member	Early middle Eocene	Bluish white weathering shale, siltstone, and limestone; tan limestone, grayish green claystone	Continental, lacustrine	Similar to Fossil Butte Member (below), but far less abundant and often poorly preserved (Oriol and Tracey 1970)
Green River Formation, Fossil Butte Member	Early middle Eocene	Buff limestone and marl- stone, brown oil shale, gray siltstone and clay- stone	Continental, lacustrine	High diversity of abundant well-preserved fossils; includes 31 species fish; 5 species turtles; 4 species crocodilians; 21 species birds; 2 species mammals; numerous insects, mollusks, plants (McGrew and Casil- liano 1975, Fremd 1982)
Wasatch Formation	Early to Eocene middle	Predominantly mudstone of red, yellow, green, brown, gray color; includes sand- stone, limestone, and conglomerate beds	Continental, fluvial, alluvial lacustrine	Diverse vertebrates, in- cluding at least 20 genera and 20 species of mammals (McGrew and Casilliano 1975)
Evanston Formation	Paleocene and Upper Cretaceous	Boulder-conglomerate beds; carbonaceous sandstone, claystone, and siltstone; lignite, and sparse coal beds	Continental, fluvial, paludal	Plant remains, inverte- brates; rare vertebrates including jaw fragment of <i>Triceratops</i> and 14 genera of Paleocene mammals (Gazin 1969)
Adaville Formation	Upper Cretaceous	Interbedded gray sand- stone, siltstone, carbon- aceous clay and shale	Continental, paludal	Plant remains, inverte- brates (Rubey et al. 1975)
Hillard Shale	Early Upper Cretaceous	Tan to gray claystone, partly lignitic sandy siltstone, sandstone, and bentonite	Marine, nearshore	Abundant mollusks (Rubey et al. 1975)
Gannet Group	Lower Cretaceous	Red sandy mudstone with limestone beds; red mudstone, crossbedded sandstone, and massive conglomerate	Continental, fluvial and lacustrine; and marine, nearshore	Plant remains, ostracods (Eyer 1969)

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Pittsburg and Midway's Kemmerer coal mine

significant beds, but less so than the upper part. Other oil shale beds in the Wilkens Peak and Laney Members considered significant resources are on the edge or just outside the KRA to the east and southeast (Culbertson, et al., 1980). The only oil shale reserves suitable for surface mining are located outside of the KRA, east of Flaming Gorge (Rocky Mountain Energy, 1981). Due to presence of higher quality oil shale in Colorado and Utah, and the uncertain economic climate for oil shale, no development of the resource in the KRA is expected during the life of the plan.

Phosphate

Outcrops of phosphate rock occur in the western half of the KRA as part of the Phosphoria Formation of Permian age. Phosphate mining occurred as recently as 1978 at Leefe, Wyoming (Stauffer Chemical Co.). The mine has closed, but the processing plant is still operating, receiving ore from Idaho (Geol. Survey of Wyoming, 1978). Prospecting for phosphate has taken place in the Sublette Range north of Cokeville and in the Rock Creek area west of Kemmerer.

Tenneco Oil Company holds a phosphate lease in the Sublette Range. With 1978 as a base, U.S. phosphate demand is predicted to increase at a yearly rate of 2.5 percent until 1990. Florida produces 76 percent of the U.S. production (U.S. Bureau of Mines, 1981).

Locatable Minerals

Potentially locatable mineral deposits in the KRA include uranium, copper, titanium, and bentonite. Locatable minerals are those "valuable mineral deposits" which do not fall under the purview of the mineral leasing acts and do not include common varieties of sand, stone, gravel, cinders, pumice, pumicite, and clay (Maley, 1983). Mining claims are staked for locatable minerals, either placer or lode claims.

In the KRA, there has been a very limited mining history associated with mining claims, although numerous claims have been staked. Phosphate mining claims, located prior to the Mineral Leasing Act of 1920, were once mined near the western edge of the KRA as part of the Leefe phosphate

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mine. The claims were eventually patented. Clay has been mined for about 20 years by Interstate Brick on mining claims located north of Evanston. Another area of patented mining claims are located on phosphate outcrops north of Cokeville. Those claims have been prospected and were mined briefly. Numerous other claims were recorded with the Counties over the years, but some were not recorded with the BLM as required by FLPMA, and are no longer valid.

Concentrations of claims occur in the southeastern part of the KRA around T. 16 N., R. 113 W., which may be located for uranium. Another concentration occurs west of Kemmerer and are probably oil shale claims. Other claim groups are scattered around the KRA.

An oil shale withdrawal covering large portions of the KRA has prevented new locations since the withdrawal took effect.

Salable Minerals

Salable minerals include, but are not limited to, "common varieties" of sand, stone, gravel, pumice, pumicite, cinders, clay and other mineral materials, and petrified wood. Salable minerals historically have been used in the KRA for tools, building materials, roads, etc. Their importance continues today, especially for road building and other activities associated with the oil and gas industry and maintenance of State and Federal highways. Sand and gravel, sandstone, and quartzite are commonly used. Lichen-covered sandstone is removed for use as decorative stone.

Sand and gravel is generally confined to terraces and elevations along streams and rivers. Building stone and fill material are found in many of the more resistant ridges, especially in the Overthrust Belt. In some of the developing oil and gas areas located away from major streams, location of suitable road building material has been a problem. Sometimes gravel has been hauled tens of miles, an expensive operation. More quarrying of resistant ledge rock, rather than gravel, may be necessary to avoid long haul distances. BLM presently has three community pits for mineral materials. One is located eight miles northeast of Kemmerer and contains sand and gravel. Two others are near Cokeville, Wyoming, and contain limestone and shale.

Geologic Hazards

Seismic hazards, landslides and avalanches, and abandoned mine workings are hazards in the

KRA.

Seismic hazards stem from high-angle faults in the Overthrust Belt. The Rock Creek Fault, located about 12 miles west of Kemmerer and oriented in a north-south direction, is an example. Recent movement has occurred on the fault, as indicated by offset recent deposits (Rubey, et al., 1975). Other faults with Quaternary movement (less than 2,000,000 years old) in the area include one at Whitney Canyon near Evanston, Wyoming, and two faults west of the Crawford Mountains just over the State line in Utah. Recently, numerous other faults with Quaternary movement have been recognized (Gibbons and Dickey, 1983). Faults outside the KRA may have an effect inside it. The Bear Lake Fault, about 10 miles west of the western edge of the KRA, had an earthquake of 6.3 magnitude in 1884, and the Rock Creek Fault may be capable of a larger earthquake (USDI, 1983). The extent of the hazard presented by various faults depends on many factors including the intervals and last date of movement, and other factors for which information may not be available. In general, the eastern half of the KRA in the Green River Basin falls into a "minor damage" area. The Overthrust is part of an expected "moderate damage" area that extends into Utah (U.S. Department of Commerce, 1973).

Landslides and earthflows are common in the Overthrust where steep slopes, relatively high moisture (snowmelt), and clayey impermeable subsoils occur. The line of contact between the Green River and Wasatch Formations is particularly susceptible to slumping, and the Wasatch Formation itself is prone to swelling and failure due to presence of bentonite clay (Rubey, et al., 1975). Areas containing Wasatch-Green River material have the highest landslide potential. Recently, a massive earthflow of approximately 50 acres occurred in the Wasatch Formation, at the Fossil Butte National Monument west of Kemmerer. This mass movement caused major damage to a rail line, requiring extensive earthwork to restore service. The rest of the area has low to moderate landslide potential, although certain formations stand out as landslide candidates; including the Bear River, Gannett Group, Stump, Ankareh, Darby, and Amsden formations (Osterwald, et al., 1977). Damages caused by landslides include soil loss (productivity), road embankment damage (from slippage or from erosion due to plugged culverts), and sedimentation of streams and reservoirs. Areas of high landslide potential are shown on Map A.

Rockfalls are common in roadcuts and stream cuts that cross the generally north-south-trending structure of the Overthrust Belt. A blockslide,

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consisting of a large single mass of rock, slid down the west side of Oyster Ridge near Diamondville, probably as a result of a man-made cut across the toe of the slope (USDI, 1979).

Steep slopes on ridges, especially in the northwest quarter of the KRA, contain avalanche chutes which can be active given certain snow conditions. Landslides and avalanches can be triggered by man's actions, as well as by natural processes. One of the natural processes which could be involved is earthquake activity. Rockslides at Rock Creek Fault probably resulted from earthquakes (Rubey, et al., 1975). Man's disturbance through vegetation removal and road building in high potential areas can trigger landslide movement.

Workings and subsidence from past underground mining could be hazardous under certain conditions. Some of the underground coal mine adits are closed off, while others are partially or completely open. Most are concentrated along a ridge called Oyster Ridge running north and south through the middle of the KRA. Presently, the Wyoming State Department of Environmental Quality is administering a program to rehabilitate abandoned mines which will eliminate many of the hazards. The first rehabilitation effort in the KRA will start in 1985. Included in the rehabilitation program are some subsidence features along the west side of Oyster Ridge near Kemmerer. Surface subsidence from underground coal mining does not occur over extensive areas near Kemmerer, primarily due to the rapid increase in depth of the coal seams away from the mine openings. In addition to the coal workings, several adits from phosphate prospecting areas are partially open near Raymond Canyon, north of Cokeville.

Paleontological Resources

The KRA is rich in vertebrate, invertebrate, and paleobotanical specimens. Table 3-7 shows the variety of fossils, but it is by no means a complete summary. The Bridger Formation, for example, is not included. It occurs over a large part of the eastern half of the KRA in the Green River Basin. It has produced at least 25 families of fossil mammals (McGrew, 1971). Invertebrate and paleobotanical localities are numerous, and include fossil mollusks, leaves, algae, pollen, spores, and insects. A spectacular assemblage of vertebrates and invertebrates is found in the Green River Formation of Eocene age, part of which is now under the jurisdiction of Fossil Butte National Monument west of Kemmerer. The degree of

preservation of intricate structures in the 60 million year old specimens is duplicated in only a few other areas of the world.

SOILS

Soil Types

Soils of the KRA have formed from a wide variety of geologic material, ranging from formation over underlying rock (termed residuum) to those formed in material transported by wind (aeolian deposits), water (alluvium), gravity (colluvium), and ice (glacial till). These parent materials, along with variable climate, topography, vegetation, and management, produce soils with diverse characteristics.

A general soils map (Map D) of the KRA is based upon interpretive grouping of land form and soil information found in the general soil maps of Uinta, Lincoln, and Sweetwater counties. Due to the broad delineations used in these maps, site specific interpretations cannot be made. The KRA has been divided into 35 geomorphic soil subgroups describing slope, depth, texture, and general soil characteristics. For discussion purposes, these subgroups have been combined into five major geomorphic groups:

Geomorphic Group I, Foothills of the Overthrust Belt: This group occurs in the west central and southwestern portion of the KRA and makes up 38 percent of the area. Dominant parent materials consist of residuum formed over upthrust sediments, colluvium including landslide and earth flow deposits, and alluvium on footslopes and drainages. The shallow to moderately deep well-drained soils are found in rolling to steep (6-60% slope) topography. Geologic overthrusting and resulting mixed exposures (parent materials), have produced variable soil textures and very complex soil/landform relationships. Opportunities to mitigate adverse impacts to soils are limited by the dominance of shallow soils, low precipitation and moderate to high landslide potential.

Geomorphic Group II, Sedimentary Uplands: The east central and northeastern portion of the KRA is dominated by a mixture of sedimentary uplands and badlands, making up 33 percent of the total area. Residuum found over flat lying sediments, dune-like aeolian deposits, and alluvium from the uplands prevail. Soils are generally alkaline, ranging from shallow to deep on a nearly level to very steep (0-70% slopes) topography. Although

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usually well drained, some areas such as the shale uplands and badlands have clayey textures and salinity problems resulting in poor availability of moisture to plants. The sand dune areas north of Opal and in the Blacks Fork River uplands have sandy and loamy soils which are excessively drained with little water holding capacity. The combination of low precipitation, salinity, and excessively drained soils limits opportunities to mitigate impacts to soils. The basin soils of the north central uplands are generally formed in shales producing clayey textures. Poor infiltration, high runoff, and high potential for slumping characterize this area.

Geomorphic Group III, Mountains: The mountainous areas of the north and extreme southern portion of the KRA make up 8 percent of the total area. Parent materials include residuum from sedimentary rock, colluvium from landslides and earthflow, and alluvium in fans and drainages. Glacial till occurs in the southern portion of Uinta County. Slopes range from gently sloping to very steep (3-70%). Very shallow to deep gravelly, loamy, and clayey soils predominate. Coniferous vegetation and aspen are often present on the north facing slopes, which receive greater effective precipitation resulting in higher productivity and organic matter enrichment. The steep slopes, short growing season, and high landslide potentials limit management opportunities in this area. Soils on public land in the Star Valley area mainly occur within the mountain soils category (approximately 85%). Soils on foothills, alluvial fans, terraces, and flood plains occupy the remaining 15 percent of these lands.

Geomorphic Group IV, Alluvial Fans and High Terraces: Alluvial parent material on terraces, fans and pediments, prevail in the extreme south central and north western portions of the area. This group makes up 11 percent of the KRA. Soils forming on these nearly level to moderately steep (0-30% slopes) features are generally well drained gravelly and cobbly sandy loams. The cobbly surface and occasional steep slopes limit management opportunities primarily due to low vegetation productivity.

Geomorphic Group V, Floodplains and Low Terraces: This group makes up 10 percent of the KRA and is found along major drainages throughout the area. These nearly level to strongly sloping (0-15% slopes) soils are generally deep, variable in texture and derived from alluvium. Although usually productive, areas of saline-alkaline affected soils limit vegetation production.

Soils of Lincoln, Uinta, and Sweetwater counties within the KRA are being surveyed by the SCS

on a request basis. Data are limited and are confined to private lands and scattered tracts of public holdings. Information on the surveyed acreage can be obtained through the SCS office in Rock Springs. The BLM initiated a soil survey in 1983 of contiguous public lands within Lincoln and Uinta counties. Data on this survey are available at the Kemmerer Resource Area office.

Soil Erosion

Natural erosion is the detachment and movement of material under conditions unaffected by the activities of man (USDA, 1981). Accelerated erosion is man-induced detachment and movement of soil. Accelerated soil erosion can be induced through burning, excessive grazing, tree harvesting, and activities which destroy or weaken vegetation and expose soil to moisture runoff and wind. The degree to which accelerated erosion has modified landscapes and soils can be estimated through use of an "erosion condition" classification system and inventory (USDI, 1980) and through soil examination during soil surveys (USDA, 1981). Watershed inventories (USDI, 1976) within the KRA, have reported erosion condition of lands as follows: 52 percent in slight erosion condition; 37 percent in moderate erosion condition; 5 percent in critical erosion condition, with the remainder being stable (USDI, 1976a). This reflects the acreage affected by erosion and not quantities of soil loss. Although natural erosion does occur, accelerated erosion (e.g., due to roads, oil and gas exploration and development, mining, and grazing pressure) predominates in critical erosion condition areas. The highest percentage of public land in critical erosion condition occurs within the foothill and upland geomorphic groups of Lincoln and Uinta counties (Map D).

Soils within the KRA generally have a high wind and water erosion hazard susceptibility. Exceptions occur along most major drainages (A1, A2, V1, V3, V5, V6 on Map D), and terraces (T1 on Map D) due to low slope gradient, high surface rock content (terraces), and high potential productivity (floodplains). The soils within the foothill group are highly susceptible to water erosion due to shallow depth, poor development, steep slopes, and sparse vegetation. Areas within the upland group to the east experience a combination of the above, plus a high wind erosion susceptibility due to sandy textures and high lime content. The remaining critical erosion condition areas identified are within the uplands of Sweetwater County. Natural erosion predominates with accelerated wind and water

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erosion identified near Flaming Gorge National Recreation area.

Proper management to protect high erosion hazard areas and to improve areas of critical erosion condition includes: use of grazing practices which maintain or enhance vegetative cover, slope restrictions on development disturbance, and detailed engineering or revegetation proposal requirements for disturbance in poor reclamation potential areas. Management opportunities to control soil erosion and increase vegetative cover by allotment are identified in Appendix A-6.

WATER RESOURCES

Groundwater

Groundwater in the KRA is contained in two geologic regions which may be referred to as the Green River and Overthrust Belt Structural Basins. Both regions, although different in geologic history, generally share the same water quality and quantity characteristics and will be discussed together. Groundwater yield is variable.

Maximum yield from existing wells ranges from about 1 to 500 gallons per minute (gpm). However, the majority of wells yield about 10 to 100 gpm (U.S. Geological Survey, 1968; Lines, 1975). The potential exists for yields in excess of 500 gpm, however; to net this flow rate, wells must be drilled (2,000 to 5,000 feet deep) into the Wasatch or Fort Union formation of the Green River Basin. In many instances, these formations produce artesian-type wells. Recharge to the Green River and Overthrust Basins comes from the Overthrust area along the Wyoming Range. Some recharge comes from the Green, Hams Fork, and Bear Rivers but is of the local mound type recharge along the riverbanks.

Water quality problems also exist in the Bridger Valley around Mountain View and Lyman where shallow wells in the alluvium yield water which is high in fecal coliform and fecal strep. The high coliform counts are due to leach fields and barn yards (CH2M Hill, 1978).

Most of the aquifers have either sodium bicarbonate or calcium bicarbonate type of waters which are suitable only for livestock and industrial use. Only the Laney shale and possibly the Tipton shale members of the Green River Formation have high dissolved solids and may not be suitable for most uses. Areas of domestic groundwater exist but because of either location or yield, the sources are not in large scale use.

Surface Water

Approximately 498,000 acre feet of water leaves the KRA annually by way of the Bear and Green River drainages. Tributaries to these drainage systems for the most part originate on the Bear River Divide (Map E). The water on the east side of the divide drains into the Green River and on the west into the Bear River. The Bear River water quality is considered good but it varies between subdrainages due to differences in land use, geology, and vegetation. The water type is calcium bicarbonate. This compound is common to large areas of the local geology. It enters the water by surface runoff and/or ground water inflow. Other major chemical constituents in the Bear River are listed in Table 3-8. Approximately 57 tons per square mile of these constituents and an unknown sediment quantity are washed into the Bear River annually. These amounts, especially the sediment, are thought to be greater than that of the Green River because of higher precipitation and steeper slopes in the Bear River watershed. Average daily flow for the Bear River at Border, Wyoming, is estimated to be 432 cubic feet per second (cfs). Spring runoff occurs from March through late July. During the remainder of the year, flow is maintained by springs, groundwater inflow, and surface runoff from summer and fall rains.

The main tributaries draining into the Green River from the KRA are the Hams and Blacks Fork. Both rivers originate outside the resource area and converge at Granger. From Granger east to the confluence with the Green River, the drainage system is known as the Blacks Fork (Map 10). Unlike the Bear River, the water quality of the eastern two-thirds of the KRA (Hams and Blacks Fork region) is highly variable due to size and precipitation differences among the smaller subwatersheds. The water type is predominately calcium bicarbonate. On several occasions samples collected from the Blacks Fork near Little America showed the water to be high in sodium sulfate. The chemical constituents common to the Blacks Fork are shown on Table 3-8. Approximately 1.49 tons per acre of sediment and 76 tons per square mile of chemical constituents enter the Blacks Fork annually. Average daily flow for the Blacks Fork near Little America is estimated to be 373 cfs, with spring runoff occurring from March to July. The rest of the year, the flow is maintained by springs, groundwater inflow, and summer and fall rain showers.

Surface waters in both the Green and Bear River are used in several ways. Towns such as Kemmerer, Frontier, Diamondville, and Evanston

TABLE 3-8
YIELDS OF MAJOR CHEMICAL CONSTITUENTS

Constituent	Bear River (Border, WY) PPM*	Blacks Fork (Little America, WY) PPM*	Drinking Water Standards ¹ PPM*
Bicarbonate	248.9	260.6	—
Carbonate	0.9	3.3	—
Calcium	59.2	87.6	250
Magnesium	23.8	40.4	—
Sodium	24.6	182.8	1,000
Potassium	2.4	4.1	—
Chloride	24.7	61.4	250
Sulfate	58.1	444.4	250
Total Dissolved Solids	333.0	639.9	500

¹ U.S.P.H.S. Drinking Water Standards - 1962

— No Threshold Value set

* Values are based on average annual discharge.

obtain some, if not all, of their domestic water from nearby rivers. Industries like oil and gas, trona, and coal use surface water in some phase of product processing. Livestock watering and irrigation are the chief agricultural uses.

Salinity is the greatest single factor limiting water use and development. On the average, approximately 376,000 tons per year of salt leave the KRA via the Bear and Green River drainage systems. This generally occurs by natural processes such as erosion from surface runoff and dissolution of salt from undated geologic formations. Areas prone to having high salt concentrations are local flood plains adjacent to established drainages, specific geologic formations, and soils derived from salt associated parent materials.

Phosphorus loading in the Bear and Green Rivers is another concern in this area in that it is directly responsible for the eutrophication of the Flaming Gorge Reservoir and Bear Lake. It is assumed that part of the total phosphorus load in the Green River is directly attributable to BLM land.

VEGETATION

Information concerning vegetative resources was obtained in 1981 using Landsat imagery and computer enhancement techniques. Table 3-9

depicts the vegetation types and percent of each found in the KRA. Map F shows a general vegetation type map for the area. A list of vegetation by genus and species was prepared during the analysis of the management situation. It is available in the Kemmerer Resource Area office.

Vegetation Types

Vegetation types used by BLM are broad classifications dominated by communities of shrubs, trees, forbs, and grasses. These broad vegetation types are an expression of the wide range of climatic and edaphic conditions found throughout the KRA. A 1981 Landsat scene was used to classify the vegetation in the KRA. Landsat scenes have many limitations in defining small or low density cover areas. Because of these problems and high soil reflectance, some vegetation types which can be discerned from the ground or the air have been combined into general categories. The following are general descriptions of the broad vegetation types found in the KRA:

Juniper - The juniper woodland type is characteristic of a variety of site conditions. Utah juniper is the main component. Juniper is generally located on areas of exposed bedrock; it has the ability to utilize water channeled through the cracks. The Soil Conservation Service currently describes these sites as shallow breaks

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Table 3-9
VEGETATION TYPES
IN KEMMERER RESOURCE AREA

Vegetation Class	% Area For All Allotments
Juniper	.7
Sagebrush	51.2
Saltbush/Greasewood	8.4
Sagebrush/Juniper	12.0
Riparian	.9
Cropland	.3
Aspen	3.4
Barren/Cultivated	.7
Cottonwood/Willow	.3
Mountain Shrub	.9
Coniferous Forest	.7
Low Density Shrub	18.4
Grass/Shrubland	2.0
(Water)	(.1)

and very shallow range sites. Juniper also does well on loamy pockets of deeper soils found in mountainous topography. The shallow breaks and very shallow range sites include both deep pockets and very shallow, dry areas. This community is found on most slopes, from steep to gently rolling hills. The majority of this type is found in the southern half of the KRA. Associated species are bluebunch wheatgrass, needle and thread, thickspike wheatgrass, bluegrasses, limber pine, big sagebrush, rabbitbrush, and forbs.

Sagebrush/Juniper - The sagebrush/juniper type is found throughout the KRA. These areas are found along with the thicker juniper stands but have lower densities of juniper with a mixture of sagebrush. These are important areas for wildlife.

Sagebrush - The sagebrush type is the predominant vegetation community in the KRA, making up over half the vegetation of the area on an acreage basis. This type occurs from the basins to the mountains on generally well drained, non-alkaline soils. Big sagebrush is the dominant shrub on this type. Rabbitbrushes are also associated with the sagebrush type. Major grass species associated with this community are thickspike wheatgrass, western wheatgrass, needle and thread, bottlebrush squirreltail,

bluebunch wheatgrass, and a number of bluegrasses. The sagebrush community is very important to and is heavily utilized by livestock and wildlife.

Saltbush - Another important vegetative community is the saltbush type. Gardner saltbush is the major shrub species. This type is generally found on heavier, more alkaline basin soils. This community often intergrades into the greasewood and desert shrub types. The major grass species in these communities are bluegrasses, bottlebrush squirreltail, and indian ricegrass. These communities are important sheep winter ranges.

Greasewood - Closely associated with the saltbush type are the greasewood communities, found typically along the deeper soils of the basin drainages. These soils characteristically have a higher salt content, and are located along the basin drainages where the water tables are somewhat higher. Nuttalls alkali grass, inland saltgrass, and a few forbs are generally associated with greasewood communities because of the higher salinity levels typical of these sites. Greasewood and saltbush types occur more frequently in, but are not limited to, the southern and eastern portion of the KRA (note that the saltbush and greasewood communities are described as the same type in the Landsat vegetation type classification).

Riparian - Riparian communities are important to wildlife and livestock. Riparian communities are comprised of wet meadows, willow thickets, and riparian woodlands. These communities are associated with an unusually high water table. The wet meadows are generally dominated by sedges, rushes, hair grass, and other species dependent on being submerged part of the growing season. Other areas are dominated by a variety of willows, shrubs, and trees (cottonwoods) dependent on higher water tables. These sites are among the most productive (2,000 lb/acre or greater) of any in the KRA.

Croplands occur along the major drainages. Bear River, Hams Fork River, and Bridger Valley are the major areas under cultivation and are considered here because these lands are located within the administrative boundaries of the KRA, but are almost all private lands.

The cottonwood/willow communities are typically found along stream courses and in areas of springs and seeps. These areas are very important in terms of wildlife habitat. Fisheries, big game animals, raptors, and waterfowl benefit from cover and food provided by these sites.

Aspen - Scattered throughout the KRA is the aspen type. These communities are very important



Juniper woodland type showing shallow soils and sparse understory



Big sagebrush community with well developed herbaceous component

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Highly productive riparian area on Pine Creek

to many species of wildlife which depend on them for forage and cover. Aspen usually occurs at the higher elevations along the northern and eastern exposures where snow accumulates, in areas associated with springs and seeps, and along the upper reaches of drainages. Aspen communities have a wide range of understory species dependent on microclimate and grazing history. Understories range from willow and other shrubs to areas dominated by grasses and forbs.

Barren - The barren/disturbed classification is used to describe those areas taken out of production by the activities of man, such as oil and gas activity. Additionally, areas of rock outcrop, badlands, sand dunes, and areas with low density vegetation are classified in the barren category.

Mountain Shrub - The higher elevations throughout the KRA are dominated by the mountain shrub community. These are very important areas for wildlife, as well as some livestock grazing. Deep pockets of loamy soil and high moisture content (snowdrift areas) tend to make these areas very productive. Snowberry, serviceberry, chokecherry, and bitterbrush dominate these areas. Grasses and forbs

frequently found in association are mountain bromes, slender wheatgrass, lettermans and columbia needlegrasses, lupines, and groundsels, and others inhabit these moist areas. The mountain mahogany subtype is found on shallow, drier slopes. These communities frequently have little or no understory associated with them. Mountain mahogany is generally found in the western part of the KRA. Mountain mahogany is an important browse species for wildlife winter range. These are typically lower production sites compared to the other mountain shrub subtypes, and are generally found on south and west aspects.

Coniferous Forest - Coniferous forest communities are found mainly near the Bridger Valley and in the northern portion of the KRA at the higher elevations. Lodgepole pine, Englemann spruce, Douglas fir, subalpine fir, and limber pine are the major conifers found in the KRA. Most conifer stands have little or no understory. Many conifer species are found invading aspen stands as community site potential advances. These forest types are very important in terms of wildlife habitat and are also of importance as a source of firewood and timber for commercial forest products.

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Low Density Shrub - The Landsat classification "low density shrub" is a combination of communities which have less than 10 percent canopy and ground cover. These areas are comprised of the following communities: saltbush, desert shrub, winterfat, alkali sagebrush, black sagebrush, and ridgetop communities. These communities are typically lower in production and are most often limited to the 7 to 9 inch precipitation zones. This type is found principally in the southern half of the KRA. This type also includes the winterfat subtype which occurs in scattered, small areas, mainly in the southern and eastern portions of the KRA.

Grass/Shrubland - Interspersed throughout most of the vegetation types in the KRA are those plant communities that are dominated by grasses. Rhizomatous wheatgrasses, such as thickspike wheatgrass and western wheatgrass are the most prevalent species. Also included in this type are areas of Gardner saltbush where grasses make up the majority of the vegetative production by weight. These are generally areas of more clayey soils found in drainages.

Poisonous and Noxious Plants

Poisonous plants and noxious weed species occur throughout the KRA. Deathcamas, larkspur, halogeton, and locoweed are the major poisonous plant species found on the area. Few livestock deaths have been reported which have been attributed to vegetation poisoning. However, localized areas in the Cumberland and Willow Creek allotments do have problems with poisonous plants. Arrow grass occurs in meadows and can be a problem. Table 3-10 depicts the major poisonous plant species occurring in the area and some of their toxic effects to grazing animals.

The predominant noxious weed species in the area include Canadian thistle, whitetop, musk thistle, and Russian knapweed. Canadian thistle is responsible for the most severe problems in meadows and some irrigated pastures.

Threatened and Endangered Plants

The KRA does not have any plants listed or proposed for listing under the Endangered Species Act. However, there are two species of plants which were inventoried to determine whether they should be listed. The plants, both twinpods, *Physaria condensata* and *P. dornii* were found to be narrow endemics with no immediate

threats. However, disturbance of the plants habitat would represent a threat to these restricted species. *P. dornii* occurs on calcareous shaley slopes in Lincoln County (Figure 3-3). Typical habitat is a shrub/grass complex dominated by *Cercocarpus montanus* (true mountain mahogany) and *Agropyron spicatum* (bluebunch wheatgrass). *P. condensata* is more widespread but does occur in a unique cushion plant community northeast of Kemmerer (Figure 3-4). This cushion plant community is dominated by three types of endemic plant groups: 1) an endemic (known only from Wyoming) *P. condensata*; 2) near endemics (known from only two States); and 3) regional endemics (known from 3 to 5 States). Endemic species are a good indication of unique habitats. The community near Kemmerer with seven endemic species represents the best example of plant response to the harsh conditions found in Wyoming. Conditions at this site appear to be the optimum type for this community type because the cushions of most the species become larger than anywhere else in their range (*Wyoming Natural Heritage*, 1984). The total acreage where these plants are found is less than one thousand acres.

LIVESTOCK MANAGEMENT

The KRA has 204 grazing allotments authorized for grazing use; 140 are permitted under Section 3 of the Taylor Grazing Act and 64 are leased under Section 15 of the Act. There are 250 permittees and lessees operating livestock in these allotments. The allotments vary greatly in size, number of operators, and grazing capacity. The largest, the Cumberland Allotment, is 459,302 acres in size, has 31 operators and 66,690 AUMs, while a number of small allotments are only 40 acres in size with one operator and as few as 5 AUMs (Appendices A-7 and A-8). Current land ownership by allotment is displayed on Appendix A-8. The allotments in the checkerboard area are easily identified by the high percentage of private land shown in column four of Appendix A-8.

The KRA administers the grazing on public land in Utah and Idaho for allotments that cross the Wyoming state line. The Cumberland Allotment includes 23,953 acres in Utah. Four allotments contain the following acres in Idaho: Erwin Creek 269, Boyd Hollow 3,208, Christy Canyon 1,628, and Poison Creek 6,023. Management of these lands is controlled by Memoranda of Agreement between the Rock Springs District, the Salt Lake District, and Idaho Falls District. The Pocatello

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Table 3-10
POISONOUS PLANT LIST

Name	Habitat	Dangerous Season	Livestock At Risk	Poisoning Condition and General Information
Tansy mustard	Sandy alkaline soils	Summer	Cattle	Large amounts over long periods of time.
Arrowgrass	Wet and alkaline bottomlands	All	All (Including Horses)	Hydrocyanic acid. Dangerous when frozen or in drought.
Chokecherry	Moist deep soils mostly in foothills	All	All, especially sheep	Large quantities. Dangerous when frozen or wilted. Hydrocyanic acid.
Cocklebur	Irrigated fields and wet places	Spring	All, especially cattle and pigs	0.75% of body weight, not cumulative. First leaves or cotyledons, old plants safe.
Deathcamus	Foothills	Early Spring	All, especially sheep	Dry by early summer, white flower, odorless bulb, 0.5% of weight.
Greasewood	Alkaline bottomlands and washes	Spring	All, but mostly sheep	Oxalic acid. Large quantity on spring trails eaten alone.
Halogeton	Disturbed sites, Roads	Fall, Winter	All, but mostly sheep	Oxalic acid. Very unpalatable annual. Misused ranges.
Horsebrush	Mostly dry, semi-deserts	Spring	All, but mostly sheep	Spring trail, bighead, photosensitivity. Early yellow flower.
Larkspur	Foothills, Deserts	Early Spring	Cattle	Most toxic during early growth. All parts poisonous.
Locoweed & Milkvetch	Desert to Mountains	All, especially Spring	All	Cumulative, habitforming, some acute poisons, crazed action.
Lupine	Mountain foothills areas of deep soils	Most when in fruit	Sheep	Pods and seeds of most species dangerous, palmately compound.

Stoddart and Saith, Range Management (Second Edition), 1955.

James, L. F., R.F. Kaller, et al. Plants Poisonous to Livestock in the Western United States, Agriculture Information Bulletin No. 415 USDA, 1980.

Resource Area recently gained grazing administration responsibility from the KRA for Martha's Canyon Allotment (63 acres) and Hardman's Hollow Allotment (29 acres) in Star Valley. These two small Section 15 allotments are contiguous to larger allotments in Idaho and have the same lessees.

Thirty-three allotments are grazed by sheep, 122 by cattle, 49 by both cattle and sheep, and of the 204 allotments, 3 allotments have minor horse use. The present livestock grazing is almost equally divided between cattle and sheep use, with cattle accounting for 87,480 AUMs and sheep 74,519 AUMs (total of 161,999 Federal AUMs). Grazing capacity is shown in Appendix A-9.

All allotments have been proposed for categorization in accordance with the BLM Grazing Management Policy. This process establishes categories for allotments, priorities for making improvements, and other management actions to develop alternatives to present range

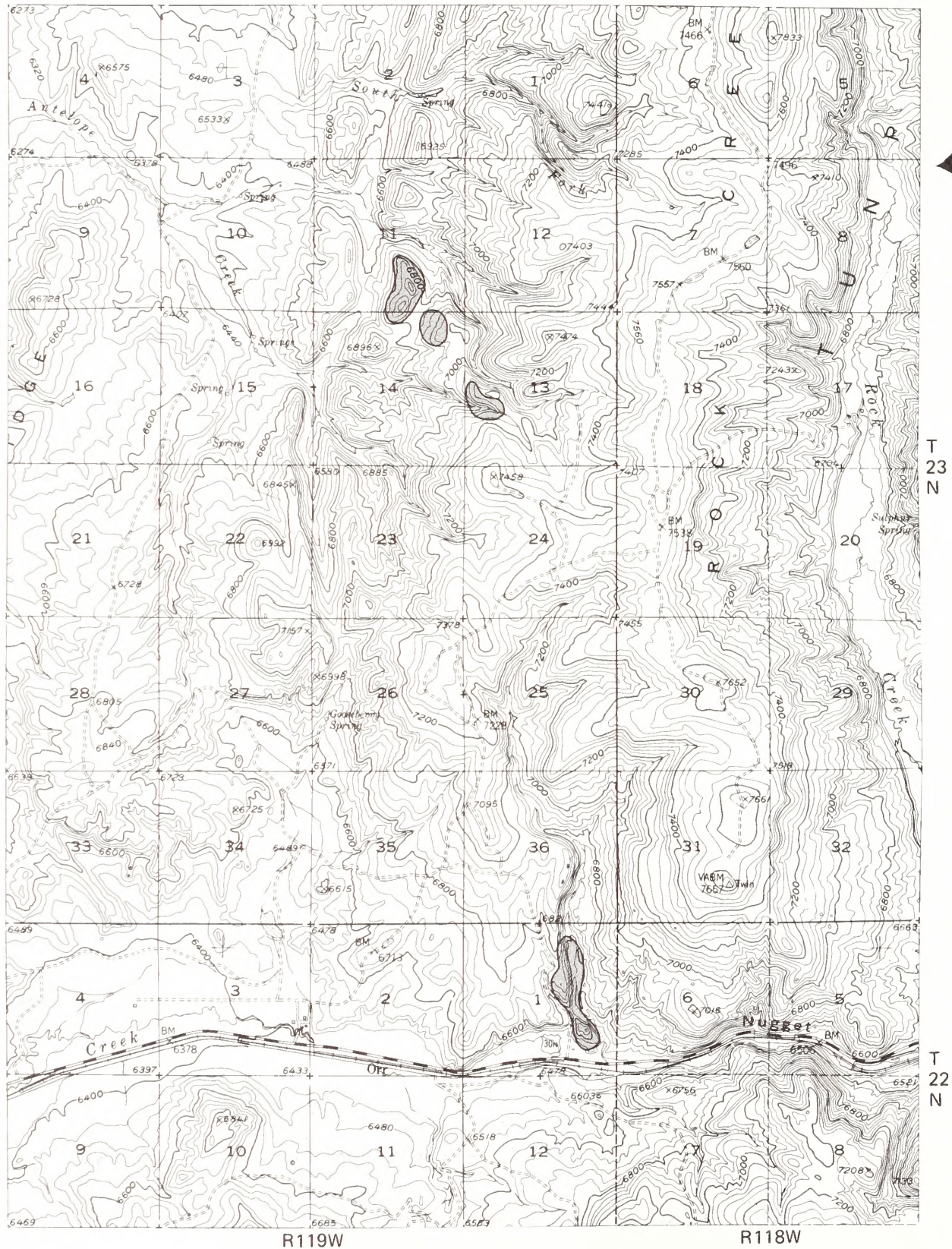
management. Appendix A-5 explains the categorization process. Appendix A-6 summarizes the problems presently identified in each "I" category allotment and the potential for improvements. The existing improvements for all allotments are shown in Appendix A-10.

Five allotment management plans (AMPs) have been or are in the process of being implemented. Table 3-11 shows the type of grazing system in each allotment. All AMPs are not fully implemented, however, and additional range improvements are needed. Table 3-11 also lists five allotments that have informal grazing systems implemented but are not considered an AMP.

WILD HORSES

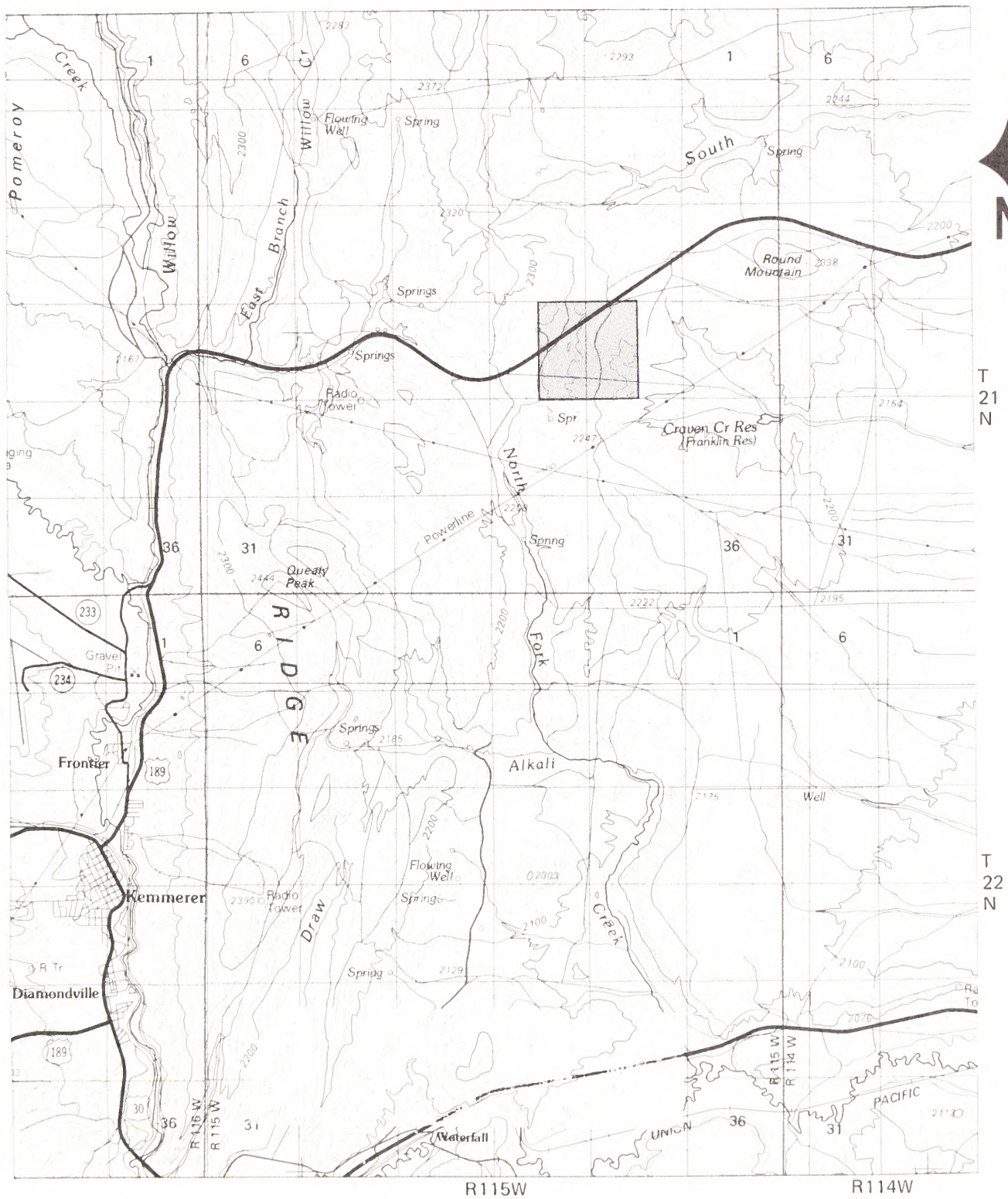
As of October 1984, there are 62 wild horses within the KRA located in the following allotments:

Figure 3-3
PHYSARIA DORNII LOCATIONS
 Kemmerer Resource Management Plan



Physaria Dornii Population

Figure 3-4
CUSHION PLANT COMMUNITY LOCATION
 Kemmerer Resource Management Plan



 Cushion Plant Community Covered by NSO Stipulations

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TABLE 3-11
GRAZING SYSTEMS BY ALLOTMENT

Allotment Name/Number	Grazing System(s) Being Implemented
Rock Creek 1035 (AMP)	Deferred rotation and rest rotation on the west pastures. The east pastures are not fenced.
Beaver Creek 1042 (AMP)	Four pasture deferred rotation
Bench 1418 (AMP)	Two pasture deferred rotation
Willow Creek 1430 (AMP)	Four pasture rest rotation
Poison Creek 1012 (AMP)	Four pasture rest rotation
Dempsey Basin 1038	Three pasture rest rotation
Inchauspe 1002	Two pasture deferred rotation
Fish Creek 1039	Two pasture deferred rotation
Leavitt Bench 1413	Four pasture rotation
Lower Cottonwood 1441	Three pasture rotation
Christy Canyon 1014	Two pasture deferred rotation

Granger, 19; and Lyman Cattle, 43. Over the past three years the BLM has removed 398 horses from the KRA. The BLM plans to have all wild horses removed from the KRA by November 1986.

F represents data collected on drainages in approximately half the KRA during a 1975-76 stream survey. Table 3-12 shows total number of miles of stream in several drainages.

FISH AND WILDLIFE HABITAT

Aquatic and Riparian Habitat

Potential riparian habitat (Map E) exists along all perennial and many intermittent streams. Most of this habitat is in a degraded condition and supports non-riparian vegetation such as sagebrush and greasewood. In many cases, severe gully-cutting has occurred, virtually eliminating the feasibility of returning the water table to its original level. Range production and wildlife habitat are lost due to the lowered water table. This decline can be attributed to both natural erosion and accelerated erosion caused by livestock overgrazing within the riparian zone. Human activities (roads, stream crossings) also contribute to the increase in erosion. Complete data on riparian condition and trend are not available for the entire resource area. Appendix

Table 3-12
STREAM MILES BY LAND STATUS

	Public Land	State	Private	Total
Smiths Fork	51.80	20.20	52.50	124.50
Thomas Fork	42.10	8.00	10.35	60.45
Hams Fork	68.45	23.00	148.20	239.65
Blacks Fork	107.10	28.55	289.60	425.25
Bear Fork	187.40	55.60	334.70	577.70
TOTAL	456.85	135.35	835.35	1,427.55

Thomas Fork - The Thomas Fork drainage contains 23.8 miles of streams on public land that have been surveyed in the northwest corner of the KRA. In 1976, stream surveys documented the existence of an essentially pure strain Bonneville cutthroat trout, a subspecies now being considered for Threatened and Endangered Species status by the U.S. Fish and Wildlife

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Service. Several streams in this drainage support good populations, with Raymond Creek containing the purest strain in the Bear River system (Binns, 1977).

The 1975-76 stream habitat survey estimated that 73 percent of the fisheries habitat is in an apparent declining trend (Appendix F). In addition, 64 percent of the riparian habitat is in poor condition, with only part of the Raymond Creek area in good condition. The lack of overhead riparian cover, which contributes to high summer water temperatures and accelerated erosion and sedimentation problems, is the primary limiting factor for cutthroat trout in this drainage (McCuistion and Smith, 1979).

Historical evidence indicates that 25 to 50 years ago, streams within the Thomas Fork drainage supported extensive riparian willow and aspen habitat, including numerous beaver complexes (McCuistion and Smith, 1979). Since then, herbicide application to stream banks in the 1960s and overgrazing by livestock have eliminated most of the riparian willow vegetation in the Thomas Fork drainage. This has resulted in reduced channel stability, accelerated streambank erosion, lowered water tables, and a general decline of fisheries habitat and range productivity in many areas. The Smith's Fork allotment, which contains most of this drainage, has the highest potential for riparian/aquatic habitat improvement.

Smith's Fork - The Smith's Fork drainage contains 23.9 miles of surveyed BLM streams that occur mainly as short segments between the Smith's Fork River and the Forest Service boundary to the east. Although 69 percent of the streams are declining in condition, over half are in good or fair condition. Enough riparian habitat remains on most drainages to allow natural re-establishment of riparian vegetation if the current trend is reversed through improved livestock management which allows rest for riparian areas. Consequently, most allotments with riparian/livestock conflicts have been placed in the "I" category.

Bear River - A total of 15.45 miles were surveyed in this area, which drains the Bridger Basin watershed south of Sage Junction and the Nugget Canyon area east of Sage Junction. Although 60 percent of the streams are in stable condition, many are eroded to the extent that their habitat condition cannot get any worse. Only six percent of the streams are considered to be in good condition (Appendix F). The soils support a fairly low density of upland vegetation and are naturally highly erosive. Overgrazing by livestock has accelerated channel erosion and reduced bank stability, causing severe gully cutting and, in most

cases, a complete loss of riparian vegetation. In many areas the water table has dropped so far that expensive physical structures would be needed to bring it back to its original level. The establishment of in-stream structures and the reduction of livestock grazing within the channel could help stabilize erosion. Sport fisheries potential is low for the Bridger Basin area, but can be improved in the Twin Creek area, which supports limited trout fisheries.

Hams Fork - A total of 34.05 miles were inventoried in the 21 tributaries forming the Ham's Fork drainage on public land north of Kemmerer. Although 59 percent of these streams are declining in condition, the current condition of the riparian zone is relatively good, with 34 percent of the area in good condition and 36 percent in fair condition. Many streams occur in areas with more stable soils and higher moisture availability thereby supporting aspen, willow, and mountain shrub communities. Beaver dams are much more prevalent, resulting in a higher, more stable water table and more extensive riparian vegetation. In these creeks, beaver ponds and a deep channel provide good resident trout habitat and support a fairly stable fishery. In contrast, Fenn, Wilkinson, West Beaver, Dempsey, Camp, Robinson, and North Willow Creeks have predominantly poor riparian habitat resulting in low sport fisheries values. Overgrazing of the riparian zone by livestock has caused soil compaction and reduced soil stability. This has contributed to accelerated stream erosion and a lack of cover and spawning habitat for trout.

Fontenelle - Only three streams in the Fontenelle drainage were surveyed (4.8 miles). All three occur in the Slate Creek allotment, which was placed in the "I" category partly because of poor livestock distribution resulting in overgrazing of some riparian zones. Roney Creek has fairly good riparian habitat and is mostly in a stable condition; overgrazing was not observed during the 1975-76 stream survey.

Black's Fork - The Black's Fork drainage contains 8.45 miles of streams that drain the foothills of the Wasatch Mountains in the extreme south portion of the KRA. Most of these creeks have relatively abundant riparian vegetation or rocky bottoms that have prevented many of the livestock-associated problems (e.g., trampling) common in most of the resource area. Although the riparian habitat is in good condition, 83 percent of the stream habitats are declining resulting in a lack of spawning habitat for trout, reduced resident populations caused by siltation, and a lack of constant perennial flows.

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Terrestrial Wildlife

Big game population estimates and Herd Unit objectives (Table 3-13) are based on data provided by the Wyoming Game and Fish Department.

Pronghorn Antelope - There are approximately 344,511 acres of crucial winter range in the resource area that support a post-hunting season population of 10,230 antelope which occur mostly in the central and eastern portions of the resource area (Table 3-13, Map B). Antelope populations have generally increased during the past several years. Current antelope populations are generally higher than the Wyoming Game & Fish objectives which were purposely set low to compensate for reduced forage availability due to competition with wintering domestic sheep. Data indicate that healthy antelope populations currently exist.

Mule Deer - There are approximately 508,724 acres of crucial winter range in the resource area that support a post-hunting population of 35,850 mule deer (Table 3-13, Map B). Of these, the two most important are in the Rock Creek and Slate Creek Areas, which support the majority of the Wyoming Range herd unit (Map B). Although populations appear stable at this time, the amount of seismic activity in the Rock Creek area and the increased oil and gas development in the Slate Creek area (Horsetrap Unit) may affect these winter ranges in the future. Additional important mule deer habitat occurs along the Bear River Divide between Evanston and Kemmerer. This area, known as the Carter Lease Herd Unit, supports an estimated winter population of 9,300 deer.

Elk - There are approximately 186,834 acres of crucial winter range in the resource area that support a post-hunting population of 2,710 elk (Table 3-13, Map B). As with deer, the two most important areas are in the Rock and Slate Creek areas (Map B). Topography in these areas varies from flat terrain dominated by sagebrush-grassland to mostly gently rolling hills with grassy ridges and mountain shrub communities scattered among the dominant sagebrush-grassland. These wind-blown, snow-free ridges and the south and west facing slopes, are the most important site-specific winter use areas for elk and mule deer. Populations of elk in all three herd units appear to be stable and at or near objective levels. Oil and gas development is encroaching on the limited elk calving areas on Dempsey Ridge.

Moose - There are approximately 64,512 acres of crucial winter range identified in the resource area that support a post-hunting population of 1,300 moose (Table 3-13, Map B). However, no crucial

winter range has been identified for the Carter Lease or Uinta-Cedar herd units. The majority of the range occurs along the major willow-dominated drainages, such as the Hams Fork and Smiths Fork, which are mostly held in private ownership. Moose populations in these areas appear stable with both herd units at or near objective levels (Table 3-13).

Upland Game

Sage Grouse - Sage grouse populations occur in most of the lower elevation sagebrush-grassland communities. Known strutting grounds are shown on Map B which reflect the general tendency for higher populations in the foothills and basins, such as Cumberland Valley and Bridger Basin. Populations in general have declined over the past several years resulting in a reduced season and bag limit in most of the KRA (Raper, 1982). The causes of this decline are not known, but may be related to increased hunting pressure or to the series of wet springs causing a reduced survival of nests and young. Although most wintering areas have not been delineated for sage grouse, research indicates they may move considerable distances in search of suitable winter habitat. Studies on the proposed South Haystack Coal Mine showed that sage grouse which nest on the eastern side of the Bear River Divide migrate east across Oyster Ridge to spend the winter, a distance of over 10 miles.

Forest Grouse - The only two species of forest grouse that occur in the KRA are the blue and ruffed grouse. Populations of both these species are scattered throughout the higher elevations and appear to be stable at relatively low densities. Blue grouse prefer areas in or near stands of coniferous forest which occur mostly on the north facing slopes of Dempsey and Commissary Ridges and in the Meek's Cabin area along the southern boundary of the resource area. Ruffed grouse prefer aspen stands or riparian woodlands and are found in most of the higher elevations, although densities are even lower than for blue grouse. Although hunting seasons are liberal for these species, most birds are harvested incidental to big game hunting.

Mourning Dove - Nesting habitat for mourning doves occurs throughout the resource area. They are most common in woodland areas, such as juniper, aspen and mountain shrub, but may nest in almost any plant community. Mourning doves migrate out of the area during the winter with numbers often reduced before the hunting season opens in September.

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TABLE 3-13
BIG GAME POPULATIONS AND SEASONAL
HABITAT AVAILABILITY BY HERD UNIT

Species Herd Unit	Population (No.) ¹		Habitat Availability (Acres) ¹	
	Existing Population ²	Objective ³	Crucial Winter	Elk Calving
ANTELOPE				
Carter Lease	6,300	3,600	131,035	
West Green River	1,630	1,400	127,013	
Cedar Mountain	2,300	4,600	86,463	
Total	10,230	9,600	344,511	
MULE DEER				
Carter Lease	9,000	6,300	85,793	
Wyoming Range	23,000	18,000	214,817	
Uinta-Cedar Mtn.	3,850	5,700	208,114	
Total	35,850	30,000	508,724	
ELK				
Carter Lease	50	100	19,270	
West Green River	2,260	2,225	167,564	89,311
Uinta-Cedar Mtn.	400	1,000		
Total	2,710	3,325	186,834	89,311
MOOSE				
Carter Lease	140	80		
Uinta-Cedar Mtn.	370	600		
Lincoln	790	685	64,512	
Total	1,300	1,365	64,512	

¹ Total numbers and acres within the Kemmerer Resource Area boundary.

² Based on 1983-84 estimate of winter population.

³ Post-harvest objectives.

Waterfowl

The following species of waterfowl are known to nest in the resource area: Canada goose, mallard, gadwall, pintail, green-winged teal, blue-winged teal, cinnamon teal, American widgeon, shoveler, and redhead. Varying amounts of waterfowl habitat occur along all drainage systems. Waterfowl nest on most permanent and

semi-permanent ponds, even those relatively isolated from perennial drainages. The 1980 "Standing Water and Wetlands Coal Unsuitability Survey" identified waterfowl habitat for 300,000 acres located between Kemmerer and Evanston, Wyoming. This survey identified 299 ponds that occur on public lands and have waterfowl potential. Analysis of these data revealed an excellent potential for increasing waterfowl production in the Cumberland Valley.

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Raptors

The following species of raptors are known to nest in the KRA (those indicated by an "*" are species of high State or Federal interest): goshawk, Cooper's hawk*, sharp-shinned hawk, marsh hawk, ferruginous hawk*, red-tailed hawk, Swainson's hawk, golden eagle*, prairie falcon*, merlin*, sparrow hawk, screech owl, great-horned owl, short-eared owl, burrowing owl*, saw-whet owl and pygmy owl. The bald eagle and rough-legged hawk are winter visitors. Raptor surveys (Map B) indicate that golden eagles and prairie falcons are common "high interest" species within suitable habitat. Raptor habitat with good potential for most "high interest" species also occurs in the following areas: Raymond Mountain, Slate Creek Ridge, Dempsey Ridge and occasional rock outcrops or cliffs scattered throughout the resource area. Burrowing owls prefer prairie dog towns for nesting habitat and have been observed in the Cumberland Valley area. Cooper's hawks nest in aspen stands and other forested types and are probably uncommon.

Threatened and Endangered Species

Four federally-listed Threatened or Endangered Species occur or may occur in the area: bald eagle, black-footed ferret, whooping crane, and peregrine falcon.

Two bald eagle winter roosts are known to occur in the area. The Woodruff Narrows roost, located along the Bear River about 15 miles north of Evanston, supports one of the largest wintering populations of bald eagles in Wyoming. From November through February, approximately 25 to 75 birds roost in the cottonwood trees along the river and feed on carrion in the surrounding mule deer and domestic sheep winter range. Waterfowl that winter along the Bear River drainage also serve as a food source. During March and April, the roost is used as a spring staging area for wintering eagles. In 1980, over 200 eagles were observed using the roost site on a single day. A second winter roost, located in Morgan Canyon about 12 miles northwest of Kemmerer, supports from 5 to 15 wintering eagles from November to March. Bald eagles may occasionally be seen

Typical golden eagle nest site on cliff



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during the winter along any of the major river systems.

Recent evidence of black-footed ferrets has been found in the KRA. Several prairie dog towns in the KRA may support ferrets. Two ferret skulls, estimated as five years old, were found in the Cumberland Valley in 1980. Several unconfirmed sightings per year are documented. During the summers of 1980 and 1981, extensive ferret surveys were conducted in prairie dog colonies located in the Kemmerer KRCRA. Although no ferret sign was found, recent research on the Meeteetse ferret population suggests that winter is the best time to locate ferrets. Therefore, the Cumberland Valley is still considered high potential ferret habitat.

The whooping crane is a rare spring/fall migrant in the area. Sightings have been reported from the Green River and Bear River drainages and from the Cumberland Valley. These sightings probably represent birds migrating between the Gray's Lake National Wildlife Refuge in Idaho and the Bosque del Apache National Wildlife Refuge in New Mexico.

Peregrine falcons may occur in the area; however, sightings are rare and difficult to confirm due to similarities in appearance between peregrine and prairie falcons. Potential nesting habitat exists in Raymond Mountain and possibly other areas.

In addition to these four threatened and endangered species, the Bonneville cutthroat trout is currently being considered for listing as a "threatened" species. Populations of an essentially pure strain of Bonneville cutthroat trout occur in the Thomas Fork drainage.

Non-game

Relative abundance of small mammals and non-game birds was determined for 16 and 15 habitat types, respectively, in the KRA. These data were collected during 1980-81 as part of the coal unsuitability process and is on file in the Kemmerer Area office. Twenty-two species of small mammals were sampled, with the deer mouse and least chipmunk being the most widespread and abundant. Mixed conifer/aspen and riparian shrub were the most diverse habitats sampled for small mammals. A total of 119 species of birds were observed in the 15 habitat types sampled. The American robin, mourning dove, Brewer's blackbird, and red-tailed hawk were the most widespread species observed, occurring in nearly all habitats. Based on these data, the

riparian and conifer/aspen communities are the most important habitat types in the KRA for supporting the greatest variety and abundance of wildlife.

RECREATION

Recreation

Recreation use is dispersed throughout the KRA. Hunting and fishing activities are often combined with camping, ORV use, picnicking, Christmas tree cutting, and firewood gathering. These are the dominant recreation activities, but other uses include rock and mineral collecting, boating, canoeing, floating, downhill and cross-country skiing, snowmobiling, other snowplay, sightseeing, hiking, backpacking, horseback riding, and national designated trail recreation. Several non-BLM developed recreation sites in the KRA concentrate visitor use. They are:

Fossil Butte National Monument - Hiking, picnicking, visitor center. Average visitor use is 20,000 visitors per year.

Bridger-Teton National Forest - Hiking, hunting, fishing, picnicking, firewood, snowmobiling, Christmas tree cutting, camping. Visitor use in 1983 was 128,600.

Lake Viva Naughton (private lake) - Camping, fishing, ice fishing, snowmobiling, cross country skiing, boating. Annual visitor use is 38,000.

Fontenelle Lake (Bureau of Reclamation) - Boating, camping, fishing, ice fishing, picnicking. No visitor use figures available.

Wasatch National Forest - Camping, boating, fishing, hunting, hiking, picnicking, firewood, Christmas trees, snowmobiling. No visitor use figures available.

Table 3-14 lists the hunting and fishing use days in the KRA. Though dispersed recreation occurs throughout the area, there are a few locations (some adjacent to Forest Service land) where hunting, fishing, camping, picnicking and ORV use occurs and/or has the greatest potential. These areas also have very high scenic values in relation to the rest of the area. Map 5 portrays recreation potential, scenic values and present undeveloped use areas. Undeveloped high use areas include Raymond Mountain, Dempsey Ridge, Commissary Ridge, the upper Hams Fork River, upper Smiths Fork River, Pine Creek, and

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Table 3-14

ESTIMATED EXPENDITURES FROM RECREATIONAL USE OF THE KEMMERER RESOURCE AREA IN 1982

Recreation Activity	Estimated Population	Recreation Days	Expenditures Per Day ¹	Total Expenditures
Antelope Hunting	10,230	4,972	\$125.04	\$ 621,698.88
Deer Hunting	35,850	33,313	64.18	2,138,028.34
Elk Hunting	2,710	17,202	76.42	1,314,576.84
Moose Hunting	1,300	935	99.60	93,126.00
Black Bear Hunting	125	626	8.28	5,183.28
Birds & Waterfowl Hunting	14,090	27.76	391,138.40	
Small Game Hunting	8,518	78.69	670,281.42	
Fishing		80,000	32.18	2,574,400.00
Total				\$7,808,433.16

¹ Expenditures per hunter and fisherman are reported by the Wyoming Game and Fish Department, Annual Report 1983. Expenditures per general recreation day were the results of a survey conducted by Walsh et al. 1981 and updated to 1982 dollars by the consumer price index.

Meeks Cabin. See Appendix H for a listing of sites with recreation potential.

Scenic Quality

Scenic quality is best described as the overall impression retained after driving through, walking through, or flying over an area of land. In the VRM process, rating scenic quality requires a brief description of the existing scenic values in a landscape. This step identifies (1) areas that should be protected, (2) opportunities for enhancement and rehabilitation, and (3) opportunities for improvement by reducing the contrast of cultural modifications. An area is divided into sub-units that appear homogeneous, generally in terms of landform and vegetation. Each area is then rated by seven key factors: landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modification. A standardized point system assigns great, some, or little importance to each factor.

Class A scenery exists on only 3 percent of the KRA, whereas Class B and C exist on 24 percent and 73 percent, respectively. Most of the Class A scenery occupies the same area as the areas of highest recreation potential. Areas of Class A scenery are characterized by mountains, ridges, creeks, thick forests of aspen and conifers, and open parks.

ORVs

High or heavy use refers to the amount of use that an area receives in comparison to the rest of the KRA. It is generally based on visual observation of the amount of recreational activity in that area as compared to the low or moderate amount of activity in another part of the KRA. No statistics are available to base a high, moderate, or low designation of use to a specific area.

Heavy ORV use occurs throughout the KRA during hunting season (September 1 through October 31). Commissary Ridge, Dempsey Ridge, Pine Creek, Raymond Mountain, Meeks Cabin, Slate Creek, Smiths Fork River, and the Upper Hams Fork River receive the greatest use at this time. Except for Slate Creek, these high use ORV areas fall within the high recreation potential sites. The only area of heavy ORV use, excluding hunting season, is in the Lyman area. Both private and public lands are used for ORV recreation near the Turtle Hill Site. Snowmobiling employs the same areas as the high ORV use areas, except for Slate Creek.

LAND RESOURCES

The KRA boundaries enclose 3,210,000 acres of land of which 1,633,00 acres, or 51 percent,

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are public lands administered by the Bureau of Land Management. The KRA is divided into two parts by the Bridger-Teton National Forest; the northern part is commonly referred to as Star Valley. Resource area boundaries do not coincide with county lines. For this reason, land ownership comparisons between county and BLM figures can be misleading (Map C and Table 3-15).

In the Star Valley area, the BLM administers only 3.5 percent (4,480 acres) of the land in small scattered tracts. This ownership pattern, combined with the remoteness of Star Valley from the rest of the KRA, creates management difficulties. Excluding Star Valley, the northern half of the KRA is largely solid federal ownership.

The checkerboard land ownership pattern, which dominates the southern half of the KRA, was created by railroad land grants that occurred from 1850 to 1871. The Union Pacific Railroad Company was granted alternate sections of land in each township within 20 miles on either side of their proposed railroad. The even-numbered sections were retained by the Federal government. Two of the even-numbered sections in each township were granted to the State for school sections; sections 16 and 36 were the original school sections. Since then, the State has exchanged the surface estate of many of these sections, retaining the minerals and consolidating their ownership in other parts of the State.

In the southwestern part of the KRA (Bridger Valley, and the area south of Evanston), most of the even-numbered sections have been patented

to private parties, in part through several Homestead Acts. This has resulted in a Federal land ownership pattern of small separated parcels. These scattered parcels and inaccessible checkerboard lands present management difficulties.

Approximately 12,000 acres of public and formerly public land have been dedicated (leased, patented, or withdrawn) for public purposes as shown on Table 3-16. The public values of other lands in the area have been protected by withdrawals (Table 3-17). There are mineral leases for oil and gas, coal, and trona which exist on the Federal mineral estate regardless of whether the surface is Federal or private. There are approximately 160,000 acres of Federal mineral estate which lie under private surface (not all mineral types are reserved to the Federal government).

The number of land use authorizations that have been granted in the KRA are shown by type in Table 3-18. The major interstate rights-of-way are generally confined to existing utility corridors; the smaller rights-of-way which serve scattered facilities (oil and gas wells or communication sites) are routed to cause the least possible disturbance. The major corridors in the KRA are shown on Map A. Major transportation routes (I-80) are also included within these corridors, reflecting BLM policy to locate utilities along existing disturbed areas rather than dispersing new disturbances. For similar reasons, a transportation system has been identified by BLM

TABLE 3-15
KEMMERER RESOURCE AREA LAND OWNERSHIP

	BLM		State		Private		Other Federal	
	Acres	%	Acres	%	Acres	%	Acres	%
KRA (excluding Star Valley)	1,628,650	50.8	137,510	4.3	1,432,000	44.7	8,000	0.2
Star Valley	4,480	3.4	4,380	3.4	129,800	93.2	—	—
COUNTY LAND OWNERSHIP								
Lincoln County*	1,015,966	38.3	123,203	4.7	596,753	22.5	913,381	34.5
Uinta County*	538,775	39.2	53,376	3.9	746,497	54.2	36,777	54.2

Lincoln - 49.7% of county within KRA boundaries

Uinta - 89.7% of county within KRA boundaries

Sweetwater - 6.3% of county within KRA boundaries

* This refers to the entire county, not just the part within the KRA boundaries.

Table 3-16

**LAND DEDICATED FOR PUBLIC PURPOSES
IN THE KEMMERER RESOURCE AREA**

	Land Status	Acreage
Fossil Butte National Monument	Federal	7,420
Seedskaadee National Wildlife Refuge	Federal	1,360
Flaming Gorge National Recreation Area	Federal	120
Air Navigation Sites	Federal	280
Cokeville Community Park	Federal	40
Pine Creek Ski Area	Federal	378
Wyoming State Hospital	Private	440
Fontenelle Creek Campground	Federal	40
Cokeville Landfill	Federal	40
Lyman - Mountain View Landfill	Federal	40
Evanston Airport	Private, Federal	320
Fort Bridger Airport	Private, Federal	640
Kemmerer Airport	Private	256
Cokeville Airport	Private, Federal	120
Lincoln County - Hams Fork Park	Federal	102
Town of Kemmerer - Greenhill Park	Federal	177
Star Valley - Youth Camp	Federal	160
Lincoln County - Highway Equip. Storage	Federal	20
Total Acreage		11,953

Table 3-17

LAND WITHDRAWALS

Withdrawal ¹	Administering ² Agency	Acres
Green River Reclamation Project	BuRec	17,000
Seedskaadee Reclamation Project	BuRec	3,600
Meeks Cabin Reservoir	BuRec	435
Seedskaadee Wildlife Refuge	FWS	1,060
Grey's River Elk Refuge	FWS	657
Fossil Butte National Monument	NPS	7,420
Flaming Gorge National Recreation Area	USFS	120
Recreation, Administration and Roadside Sites	USFS	3,950
Air Navigation Site	DOT	120
Public Water Reserves ³	BLM	2,015
Stock Driveway ³	BLM	480
Coal	BLM	136,100
Phosphate	BLM	44,600
Oil Shale ³	BLM	420,500

¹ Some of these areas may overlap so the actual acreage withdrawn is less than the sum of the individual withdrawals.

² BuRec - Bureau of Reclamation
 FWS - Fish and Wildlife Service
 NPS - National Park Service
 USFS - U.S. Forest Service
 DOT - Department of Transportation
 BLM - Bureau of Land Management

³ These withdrawals have been recommended for full or partial restoration, however, final action has not yet been taken.

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to recognize existing roads which should remain, those which should be "put back to bed", and opportunities for multiple-use of road networking.

TABLE 3-18
LAND USE AUTHORIZATIONS

Types	Approximate Numbers of Active Cases
Roads (not oil and gas related)	67
Oil and gas related (granted under Mineral Leasing Act of 1920, as amended)	187
Oil and gas related (granted under Federal Land Policy and Management Act)	131
Electric Lines	109
Telephone Lines	76
Communication Sites	29
Miscellaneous (railroads, irrigation facilities, air monitoring, etc.)	88
R&PPs	6
Easements	3

FORESTRY RESOURCES

There are approximately 22,500 acres of productive forest land in the KRA that, under intensive management, would produce an estimated sustained yield of 1.8 million board feet (MMBF) per year. This is according to 1973 Extensive Forest Inventory data. The majority of the volume will come from Commissary Ridge, Dempsey Ridge, and lands surrounding Meeks Cabin Dam.

The timber base includes areas which contain such values as scenic vistas, wildlife cover, and recreational sites. Most of these areas can be logged using special logging techniques and silvicultural practices. The area adjacent to Meeks Cabin Dam is the largest example of this kind of area. Specific areas, logging techniques, and silvicultural practices would be identified during activity planning.

There are approximately 13,000 acres of mature saw timber in the KRA. A major problem in many stands is that they are over mature and are

susceptible to pathogens. Mortality can be substantial due to dwarf mistletoe and insects.

Fuel wood and Christmas trees are the major forest products sold to local residents. There are about 400 MBF of fuel wood and about 400 Christmas trees sold every year. There is very little demand for posts and poles.

CULTURAL RESOURCES

Introduction

Cultural resources are abundant in the KRA and can be divided into three broad categories: 1) prehistoric sites, 2) historic sites, and 3) historic trails. Ages of prehistoric sites range from about 10,000 years before the present (10,000 B.P.) to the early nineteenth century, and are predominantly archaeological resources. Historic sites include homesteads from the nineteenth and twentieth centuries; abundant remains of the coal mining era (1890-present); and sites associated with stockherding, logging, early railroading, and early oil development. Historic trails are important and include hundreds of miles of emigrant trails, stage roads, and other historic routes of passage.

Site Types

Prehistoric campsites associated with sand dunes are the most common significant site type found in the KRA and therefore are normally considered eligible for the National Register of Historic Places (NRHP). Their significance lies in the fact that shifting sands frequently cover up and preserve, intact, the campsites or "living surfaces" of the prehistoric occupants of the region. Frequently, campsites of several different time periods are found superimposed, one upon the other, in the larger sand dunes. Such "stratified dunal campsites" are considered highly significant because they afford the archaeologist the opportunity to study the prehistoric lifeways of several groups in one locale through thousands of years of environmental change.

Similarly, though not as common, campsites preserved in alluvial soils along drainages are also considered significant. Prehistoric man frequently camped along stream or river terraces because of the water and other resources. Periodic flooding or inundation can preserve these sites intact. When this occurs, the sites are considered important and are considered eligible for the NRHP. Rock shelters can preserve prehistoric

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materials remarkably well. As a result, they are usually significant and eligible for the NRHP. Early man's proclivity for artistic expression on the walls of rock shelters or caves is expressed in the KRA in the form of petroglyph or pictograph sites. Petroglyph and pictograph sites afford us a unique opportunity to see how prehistoric man viewed his own environment and, as a result, are almost always eligible for the NRHP.

Because the KRA is located, in part, in the Wyoming High Plains Culture Area, the skin lodge, or tipi, was a favored type of living structure or dwelling used by historic Indian groups in the area. The footing stones for tipis, called "tipi rings" or "stone circles", are commonly found in predictable locales in the KRA. Eligibility to the NRHP of stone circle sites usually is dependent upon the degree of preservation and nature of associated artifacts at these sites. Wild game drivelines and other rock alignments, such as medicine wheels or effigy figures, are usually considered eligible to the NRHP, though they remain little studied.

A very common prehistoric site type usually not considered eligible for the NRHP involves procurement of available lithic resources for stone tool manufacture. The high desert surface of the KRA is frequently blanketed with a desert pavement of various types of sedimentary rock useful for stone tool manufacturing. This surface may be covered with pleistocene deposited quartzite cobbles, or lag gravels of various cherts, chalcedony, moss agate, or other sedimentary rocks. Use of these rocks for stone tool manufacturing is evidenced by occasional flakes or flaked cobbles found throughout the rock deposit and by crude tools pre-formed at the site. These "preforms" were then carried off to more permanent campsites for further lithic reduction. Because these procurement sites or "knapping stations" usually don't contain buried cultural materials, and because they are reflective of easily understood prehistoric activity, they can rarely provide information important in prehistory. Mitigative efforts at such sites are usually limited to mapping and possibly collecting of a sample of the lithic material procured at the site.

Historic site types in the KRA are dominated by the major emigrant trails such as the Oregon Trail and the Mormon-California Trail. Major variants of these trails may have actually carried the bulk of the emigrant traffic and include the Sublette Cutoff, the Slate Creek Trail, the Dempsey-Hockaday Trail, the Kinney Cutoff, and the Baker-Davis Road. Several other emigrant trail variants occur and portions of the Pony Express route cross the KRA. Frequently associated with the emigrant trails are Trail Registers, where

emigrants incised their names, dates of passage, home origin, and other trivia onto rockfaces along the trail. Examples of trail registers in the KRA are the Emmigrant Springs Site and Johnston Scout Rocks. Because the trails and registers are the physical remains of one of the main events in the history of the United States, that of the great westward expansion of our nation, they are generally considered significant and eligible for the NRHP. The eligibility of a particular trail segment, register, or site is based upon the degree of preservation, historical association, and integrity of setting.

Other historic site types in the KRA include early homesteads, usually dating from the late 1870s to the turn of the century. Since these homesteads are usually found on patented land, few homesteads occur on BLM-administered lands. Coal mining from 1870 to the 1930s has left many historic mines, townsites, cemeteries, and other historically significant properties. Several of the early coal sites are located on BLM land and are eligible for the NRHP because they are evidence of the earliest industrialization of, and settlement in, many parts of the KRA.

Other historically important sites involve logging, railroad construction, tie-hacking, and early oil development. Logging and tie-hacking sites are found on Commissary and Dempsey Ridges, north of Kemmerer, and in the Meeks Cabin area in the northern Wasatch Forest zone. Railroad construction in the KRA involved construction of the main Union Pacific line 1861-1869 and a Union Pacific spur to Opal, a 19th century railhead and trade center. Around the turn of the century, the U.P. line was extended to Kemmerer in response to development of the rich coal deposits located there. A link to the Pacific Northwest was provided by construction of the Oregon Shortline, roughly from Kemmerer west then northeast towards Pocatello, Idaho. Some of the earliest oil deposits in Wyoming were developed in fields south of Evanston; Brigham Young's Well being, perhaps, the most famous. Another early oil development area is centered around Granger in the eastern portion of the KRA.

Cultural Chronology

Several cultural periods are recognized in the KRA.

Paleoindian Period (Before 7,500 B.P.) - The earliest documented human occupations in North America occur during what archaeologists refer to as the Paleoindian Period. Fluted lancepoints of the Clovis and Folsom complexes (12,000 B.P.

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and 11,000 B.P. respectively) evidence early man's reliance upon extinct Pleistocene megafauna such as the mammoth, *Bison antiquus*, and extinct camels. Sites of this time period are found at the Meadow Draw Site (a questionable Clovis component was identified here) and at Haystack Draw. The latter site produced a distinct Folsom component containing a Folsom point fragment, a leaf-shaped stone knife, utilized flakes, blades, and scrapers (Metcalf, et al., 1981). Late Paleoindian occupations (9,000-8,000 B.P.), identified by lancepoints of the Cody complex, Fredrick points, Pryor Stemmed, Lovell Constricted, James Allen, and Agate Basin points, though not abundant, are occasionally recorded throughout the KRA.

Early Archaic (Altithermal) Period (8,000-5,000 B.P.) - Between 8,000 and 7,000 B.P., a major climatic shift occurred in Wyoming. Arid conditions predominated, and a period much drier than today, called the Altithermal, is recognized. Large side-notched projectile points are diagnostic of this period. Human adaptations during the Early Archaic Period include communal bison procurement using arroyo traps (Frison, 1978), and greater reliance upon vegetal foodstuffs (Creasman, et al., 1983).

Several Altithermal sites are known along the Frontier Pipeline corridor near Church Buttes and Austin Reservoir, and along the Mapco Pipeline project (Zier, 1983); near Granger in the Moxa Arch Area (Jess, 1983), and in the vicinity of Shute Creek (Wheeler, 1983). Investigations at these sites indicate a mixed hunting/gathering subsistence strategy with an apparent pattern of greater exploitation of small mammals rather than reliance upon big game.

Middle Archaic Period (5,000-2,500 B.P.) - Projectile points of the Middle Archaic Period are universally recognized to belong to the McKean Techno-complex (Mulloy, 1954). Generally considered to be dart points used in conjunction with an atlatl (spearthrower), point types include: McKean lanceolates, Duncan, Hanna, Mallory, and possibly Yonkee. Oxbow and Pinto points may also date to this period.

The Middle Archaic period represents a moderating climatic shift, with rainfall and vegetation patterns evolving towards that of modern times. Animal, human and plant populations increased and expanded; the archaeological record in the KRA records numerous sites dating to this time period. These sites are characterized by presence of greater amounts of ground stone implements and bone tools than earlier components. Greater emphasis on communal hunting, especially of bison, is

indicated. Plains indian adaptive strategies that stress reliance upon bison and use of the conical skin lodge (tipi), become more apparent in this time period.

Late Archaic Period (2,500 - 1,500 B.P.) - This period represents an expansion of exploitative strategies found in the Middle Archaic period, and is marked by occurrence of large triangular corner-notched dart points of the Elko, Besant, and Pelican Lake series. Late Archaic sites are found throughout the KRA, with Late Archaic components identified and excavated near Granger, on the Ham's Fork, and in the Whiskey Buttes areas. We assume that most available niches and resources were exploited by Late Archaic hunters and gathers. Climatic conditions appear to have been generally favorable throughout the period and may be reflective of modern times.

Late Prehistoric Period (1,500 - 200 B.P.) - Most Archaic adaptations continued into the Late Prehistoric Period, and two new and important innovations were added: the bow and arrow and pottery. Horticultural techniques, practiced in adjacent cultural areas to the south and west at present are not identified in the KRA. It is not clear at this time if the introduction of the bow and arrow directly led to population increases in the area, but the C-14 record for southwest Wyoming shows a significant increase in prehistoric activity throughout the upper Green River Basin beginning about 1,800 B.P. (Zier, 1983). Obsidian, obtained from Yellowstone Park, was used more extensively for stone tool manufacture during this period and may have been extensively traded.

The Late Prehistoric Period in the KRA can be divided into two distinct entities on the basis of differences in diagnostic arrow points, pottery, and temporal variation: a "Great Basin Fremont-influenced" type and a High Plains "Shoshonean" type. Rose Springs series arrowpoints are small, triangular corner-notched points with small stems, and suggest Great Basin affinities. Triangular side or tri-notched points in the "Desert Side-Notched" series, frequently made from a blade technology, signal a later occupation. They are also associated with Shoshonean occupations. Late Prehistoric Period sites make up the greatest percentage of archaeological resources in the KRA.

Historic Period (1800 to 1945) - Beginning with Robert Stuart and the Astorians in 1812, and the Ashley explorations in 1823, knowledge of the lands in the KRA reached Americans east of the Mississippi. Early explorers reported abundant beaver, and the KRA was a major locus of the mountain man and fur-trapping era of 1824-1840.

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At least one rendezvous, that of 1834, was held on the Hams Fork River above present-day Granger. Many local landmarks are named after fur trappers: Fontenelle Creek, Hams Fork, Blacks Fork, Sublette Canyon, Bridger Gap, Bridger Creek, Bridger Butte, Smiths Fork, Henrys Fork and La Barge Creek, as examples. The decline of the beaver market about 1840 ended the colorful mountain man era.

Immediately following was another major event in U.S. history; westward emigrant migrations. Emigrants traveled to Oregon, California, and the new Zion established by Brigham Young and his Latter-Day Saints at Salt Lake City. The KRA is traversed by over 350 linear miles of historic emigrant trails, much of these are on BLM lands (Map 2). The Bridger Route of the Oregon Trail and the Sublette Cutoff combined cover some 200 linear miles in the KRA. All of the Dempsey-Hockaday Trail, and the Blacks Fork and Hams Fork Cutoffs lie within the KRA. The Mormon Trail from Fort Bridger to the Utah state line is a unique trail segment, with several portions under federal management. Other historic routes of passage include the Slate Creek Trail, the Opal Stage Road, and portions of the Pony Express Route. Emigrant graves, trail registers, inscriptions, stage stations and pristine trail ruts can be found along several trail segments.

After the period of major emigrant passage throughout the latter 19th century, ranching settlements were established, spurred by completion of the Union Pacific Railroad in 1869. By 1890, much of the west side of the upper Green River Valley was settled as cattle and sheep country. Multi-ranch stockmen's associations managed much of the open range in southwest Wyoming. These continue into today (e.g., the Rock Springs Grazing Association, the Rock Creek Association, the Lyman Cattle Association, and the Western Wyoming Range Company).

The development of coal mines near Kemmerer around the turn of the century helped marshall in the twentieth century and add an industrial flavor to what is now the KRA. Several important mines and townsites considered to be significant historic sites are located in the region, e.g., the Cumberland Townsites, Sublette, Blazon, Suzie, Gomer, and Frontier.

SOCIOECONOMICS

Area of Influence

The KRA covers most of Lincoln and Uinta counties in southwestern Wyoming. In addition, a portion of western Sweetwater County, Wyoming, and to a lesser extent, eastern Bear Lake County, Idaho, and Rich County, Utah, are included in the resource area. Lincoln, Sweetwater, and Uinta counties will be used as the primary area of influence for this analysis. Salt Lake City, Utah, and Denver, Colorado, serve as the primary trade centers for the region, and the cities of Evanston, Kemmerer, Green River, and Rock Springs serve as secondary trade centers.

Agriculture

Agriculture was one of the early industries in the area (Institute for Policy Research, 1982). The primary form of agriculture in southern Lincoln County, Uinta County, and western Sweetwater County is livestock production. Dairy farms and cropping enterprises are located in northern Lincoln County. Cheese manufacturing has been an offshoot of the dairy industry.

Table 3-19 shows the historic trend in cattle and sheep production in each of the three counties and the State of Wyoming from 1965 to 1982. Cattle numbers increased from 1965 until the mid-1970s when market prices dropped and cattle numbers were reduced. Lincoln, Sweetwater, and Uinta counties maintained 6 to 7 percent of the cattle and calves produced in Wyoming from 1965 to 1982. Sheep production showed a decline from 1965 until 1980. Stock sheep inventories increased slightly in Lincoln and Sweetwater counties from 1980 to 1982. Lincoln, Sweetwater, and Uinta counties contained 12.6 percent of the stock sheep in Wyoming in 1982.

Income and expenditures for the agricultural sector of Lincoln, Sweetwater, and Uinta counties are shown in Table 3-20. In 1981, meat animal sales accounted for approximately 57, 94, and 81 percent of the cash receipts from marketing in

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Table 3-19
LIVESTOCK PRODUCTION BY COUNTY

County/State	1965 ¹	1970 ¹	1975 ²	1980 ³	1982 ⁴
Cattle and Calves on Farms and Ranches, January 1					
Lincoln	41,000	54,900	53,000	34,000	28,000
Sweetwater	10,700	17,400	19,000	18,000	19,000
Uinta	30,400	38,400	46,000	31,000	37,000
Wyoming	1,300,000	1,476,000	1,690,000	1,340,000	1,390,000
Stock Sheep on Farms and Ranches, January 1					
Lincoln	133,000	107,200	57,000	25,500	35,000
Sweetwater	148,000	137,000	96,500	44,000	45,000
Uinta	63,000	62,500	54,000	50,000	46,000
Wyoming	1,989,000	1,713,000	1,226,000	960,000	1,000,000

¹ Wyoming Crop and Livestock Reporting Service 1973, Wyoming Agricultural Statistics 1973.

² Wyoming Crop and Livestock Reporting Service 1978, Wyoming Agricultural Statistics 1978.

³ Wyoming Crop and Livestock Reporting Service 1981, Wyoming Agricultural Statistics 1981.

⁴ Wyoming Crop and Livestock Reporting Service 1982, Wyoming Agricultural Statistics 1982.

each of the three counties, respectively. Lincoln County received 43 percent of marketing receipts from crop, dairy, and poultry product sales in 1981. Effects of BLM management actions on agriculture would be exhibited as monetary changes in income and expenditures for meat products.

Timber

The timber industry in Lincoln and Uinta counties was enhanced in the late 1860s by the development of the Union Pacific Railroad (Institute for Policy Research, 1982), which opened additional lumber markets. In 1979, five mills were operating in Lincoln and Uinta counties with an annual production of nearly 65 million board feet and sales of approximately \$4.1 million (Wyoming Department of Economic Planning and Development, 1980). Since then, the timber industry has experienced soft timber markets due to the downturn in the national economy. Some mills have been forced to cut production and lay off employees (Casper Star Tribune, October 31, 1983).

Mining

Coal mining was responsible for much of the development in southern Lincoln and Uinta counties (Institute for Policy Research, 1982). The demand for coal was brought about by the development of the Union Pacific Railroad in the late 1860s. Table 3-21 shows the taxable coal production from the counties in the KRA. The only operating coal mines in the KRA are located in Lincoln County. Coal is utilized to supply the Viva Naughton Power Plant in Lincoln County and the FMC soda ash processing facility in Sweetwater County. Railroad facilities are available to export coal outside the KRA. Taxable coal production decreased almost 15 percent from 1977 to 1982. Coal production in the KRA in 1982 accounted for over 7 percent of the taxable coal produced in Wyoming.

Trona mining began in Sweetwater County in the early 1950s. A major portion of the sodium deposition area is located in the KRA. Trona mining provides employment opportunities for residents within the resource area, but ad valorem and severance taxes from mining and soda ash

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Table 3-20

INCOME AND EXPENDITURES FROM THE AGRICULTURAL SECTOR IN LINCOLN, SWEETWATER AND UINTA COUNTIES. (Reported in Thousands of Dollars)

	Lincoln			Sweetwater			Uinta		
	1971	1976	1981	1971	1976	1981	1971	1976	1981
Cash Receipts From Marketings	9,478	11,616	16,991	5,552	5,519	7,160	5,921	6,537	9,343
Livestock	8,549	9,843	14,733	5,414	5,272	6,763	5,692	6,118	8,607
Meat Animals	6,460	6,893	9,703	5,265	5,266	6,762	5,327	5,518	7,584
Dairy and Poultry Products	2,089	2,950	5,030	149	6	1	365	600	1,023
Crops	929	1,773	2,258	138	247	397	229	419	736
Other Income	1,469	1,941	3,053	890	1,265	1,833	775	1,086	1,647
Gross Income	10,947	13,557	20,044	6,442	6,784	8,993	6,696	7,623	10,990
Less Production Expenses	8,259	11,893	22,380	5,053	6,471	10,617	5,289	7,530	12,678
Plus Inventory Adjustment	276	-771	1,099	-129	-420	467	-54	-822	749
Statistical & Corporate Adjustment	130	125	45	44	+30	40	46	+181	29
Net Farm Proprietors Income	2,834	786	-1,282	1,216	-77	-1,197	1,307	-548	-968

Source: Bureau of Economic Analysis 1982. BEA Farm Income and Expenditures. Regional Economic Information Service.

Table 3-21

TAXABLE MINERAL PRODUCTION IN LINCOLN, SWEETWATER, AND UINTA COUNTIES AND THE STATE OF WYOMING

County/State	Coal (tons)		Trona (tons)		Oil (Bbls)		Natural Gas (MCF)	
	1977 ¹	1982 ²	1977 ¹	1982 ²	1977 ¹	1982 ²	1977 ¹	1982 ²
Lincoln	5,083,240	4,314,363		132,234	240,021	11,167,328	21,937,007	
Sweetwater	7,191,938 ³	10,828,045 ³	11,771,985	10,073,690	9,959,104	8,737,658	115,087,044	104,279,682
Uinta					3,633,587	7,934,059	22,949,460	32,929,608
Wyoming	68,792,573	104,014,096	11,771,985	10,073,690	115,678,022	108,055,462	333,332,180	351,192,737

¹ Mineral Division of Wyoming Department of Economic Planning and Development 1980, Wyoming Mineral Yearbook 1980, Cheyenne, Wyoming.

² Mineral Division of Wyoming Department of Economic Planning and Development 1983, Wyoming Mineral Yearbook 1983, Cheyenne, Wyoming.

³ This output was not all produced in the KRA and mines which were producing in Sweetwater County within the KRA are now closed.

processing operations only accrue in Sweetwater County. Table 3-21 shows that trona production in Sweetwater County decreased nearly 14 percent from 1977 to 1982.

Taxable oil production has increased dramatically in both Lincoln and Uinta counties with a five-year increase of 81.5 and 118.4 percent,

respectively, from 1977 to 1982 (Table 3-21). Natural gas production showed a similar increase of 96.4 and 43.5 percent in Lincoln and Uinta counties, respectively, during the same five-year period. Two natural gas sweetening plants were constructed in Uinta County from 1980 to 1982.

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Recreation

Table 3-14 presents the estimated expenditures from hunting and fishing in 1982. According to the Wyoming Game and Fish Department and the University of Wyoming who provide the figures for game and fish, these expenditures represent the total amount of money spent in Wyoming on their 1982 hunting experience (Phillips, 1981; Crowe, 1984).

Recreation expenditures contribute to both State and local revenues through license sales, wholesale and retail sales, and taxes.

Approximately two-thirds of the total recreation expenditures presented in Table 3-14 are attributed to hunting recreation and the remaining one-third to fishing.

Employment

Table 3-22 shows the changes in employment from 1971 to 1981 in Lincoln, Sweetwater, and Uinta counties. In general, total employment in the KRA has followed the same growth trends as the major industries discussed previously. Farm

Table 3-22
EMPLOYMENT BY PLACE OF WORK
FOR LINCOLN, SWEETWATER, AND UINTA COUNTIES¹

	Lincoln			Sweetwater			Uinta		
	1971 ²	1976 ³	1981 ³	1971	1976	1981	1971	1976	1981
Total Employment	4,641	5,080	6,622	8,584	18,225	25,993	3,237	3,823	8,103
Number of Proprietors	1,026	1,029	1,193	904	1,184	1,624	626	652	833
Farm Proprietors	502	563	616	118	113	123	265	274	298
Non-Farm Proprietors	524	466	577	786	1,071	1,501	361	378	535
Total Wage and Salary	3,615	4,051	5,429	7,680	17,041	24,365	2,611	3,171	7,270
Farm	260	211	193	216	117	108	112	101	93
Non-Farm	3,355	3,840	5,236	7,464	16,924	24,261	2,499	3,070	7,177
Private	2,646	3,030	4,286	6,116	14,550	20,943	1,495	2,013	5,929
Ag. Serv. Forestry, Fish	(D)	17	27	(D)	13	(D)	(D)	13	(D)
Mining	280	891	1,372	1,669	4,909	7,505	(D)	116	1,737
Construction	(D)	322	513	443	3,078	3,531	97	97	470
Manufacturing	262	292	487	172	306	481	(D)	146	153
Non-durable Goods	⁴	118	187	⁴	236	328	⁴	8	(D)
Durable Goods	⁴	174	289	⁴	70	153	⁴	138	(D)
Transportation	312	390	(D)	836	1,274	2,115	398	459	843
Wholesale Trade	187	163	(D)	201	493	(D)	0	56	(D)
Retail Trade	395	589	631	1,335	2,389	3,521	547	781	1,368
Finance, Insurance, Real Estate	56	83	173	(D)	317	433	46	66	204
Services	308	283	402	1,296	1,771	(D)	(D)	279	(D)
Government	709	810	950	1,348	2,374	3,318	1,004	1,057	1,248
Federal Civilian	142	84	113	164	240	285	58	81	78
Federal Military	—	88	70	3	268	240	—	81	75
State and Local	567	638	767	1,181	1,866	2,793	946	895	1,095

(D) Indicates the data is not printed due to disclosure.

¹ Estimates include entire county.

² Wyoming Department of Administration and Fiscal Control 1983, Wyoming Income and Employment Report, Division of Research and Statistics, 5th edition, June 1983 (for all counties listed).

³ Bureau of Land Management 1982, Rock Springs District Social Economic Profile, Updated and Revised in 1982 (for all counties listed).

⁴ Durable and non-durable goods are included in the total for manufacturing.

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wage and salary employment decreased roughly 26,50, and 17 percent, respectively, for Lincoln, Sweetwater, and Uinta counties during the ten-year period from 1971 to 1981. However, the number of farm proprietors increased by 23, 4, and 12 percent, respectively, in each of the three counties during the same time period. Wages and salaries in the mining sector, which includes the oil and gas industry, increased by 390 and 350 percent in Lincoln and Sweetwater counties from 1971 to 1981. Figures for 1971 are not available for Uinta County but wages and salaries in that county increased 11,397 percent from 1976 to 1981. The construction sector also showed dramatic wage and salary gains in the three counties in the 1976 - 1981 period.

Table 3-23 shows average annual unemployment rates from 1978 to 1982 and August figures for 1983 and 1984. Unemployment rates decreased in all the counties and the State from 1976 through 1979. Unemployment remained low in Sweetwater and Uinta counties as construction of the Tenneco soda ash processing plant was being completed in Sweetwater County and construction was underway on the Whitney Canyon and Carter Creek natural gas sweetening plants in Uinta County. Unemployment rates in Lincoln County increased in 1980, dropped slightly in 1981, then reached 10.9 in 1982 which was the highest rate in the State that year. Unemployment moved sharply higher in 1983 but had declined substantially by August, 1984.

Income

Total labor and proprietors income increased by 207, 846, and 611 percent in Lincoln, Sweetwater, and Uinta counties, respectively, from 1971 to 1981 (Table 3-24). Income in the mining section increased 1,456 and 1,304 in

Lincoln and Sweetwater counties during the same period. Uinta County had a 5-year increase of 2,300 percent in mining sector income from 1976 to 1981.

The farm sector was the only sector to show a decrease in labor and proprietor's income. Wage and salary income decreased in Lincoln, Sweetwater, and Uinta counties from 1971 to 1981. Farm proprietors income also decreased in the three counties during the same period. Farm proprietors in all three counties realized an aggregate negative cash flow in 1981.

Per capita personal income has increased substantially in all three counties from 1976 to 1981. Much of the increase can be attributed to increased employment in the higher paying sectors such as mining and construction.

Population

Population estimates from 1960 to 1983 for the counties and major incorporated cities and towns in the KRA are shown in Table 3-25. Both Lincoln and Uinta counties showed a declining population from 1960 to 1970, and Sweetwater County realized only a slight population increase during the same period. All three counties showed substantial growth from 1970 to 1980. Uinta County realized the most increase from 1980 to 1983.

Boomtown growth in Evanston resulted from population immigration to meet employment demands for construction of the Whitney Canyon and Carter Creek natural gas processing plants in addition to the extensive oil and gas exploration and development that was under way. Excess population growth overflowed to smaller towns in Uinta County and into Lincoln County, especially around the communities of Kemmerer

Table 3-23
UNEMPLOYMENT RATES FROM 1978 TO 1984
FOR LINCOLN, SWEETWATER, AND UINTA
COUNTIES AND THE STATE OF WYOMING

County/State	1978	1979	1980	1981	1982	1983	1984
Lincoln	5.8	4.8	6.5	5.7	10.9	9.1	5.4
Sweetwater	3.5	2.5	3.5	3.7	5.5	11.0	6.0
Uinta	3.3	2.0	2.9	2.7	4.8	8.6	5.7
Wyoming	3.3	2.7	3.9	4.1	5.8	7.5	4.9

Source: Wyoming Labor Force Trends, Vol. 21, No. 7, August 1984.

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Table 3-24

LABOR AND PROPRIETORS AND PER CAPITA PERSONAL INCOME FOR LINCOLN, SWEETWATER, AND UINTA COUNTIES (Reported in Thousands of Dollars)

	Lincoln			Sweetwater			Uinta		
	1971 ²	1976 ³	1981 ³	1971	1976	1981	1971	1976	1981
Wage and Salary Disbursements	27,241	42,048	91,969	51,497	217,450	509,977	15,325	27,033	127,342
Other Labor Income	1,429	3,899	8,233	2,698	13,819	31,653	618	1,483	7,392
Proprietors Income	5,743	5,679	5,355	4,325	10,029	12,112	3,342	2,304	2,384
Farm	4,102	768	-1,282	2,199	-17	-1,197	2,252	-548	-968
Nonfarm	1,641	4,911	6,637	2,126	10,106	13,309	1,090	2,852	3,352
Earnings by Industry									
Farm	5,383	2,133	1,016	3,233	720	155	2,775	183	267
Nonfarm	29,030	49,493	104,541	55,287	240,578	553,587	16,510	30,637	136,851
Private	24,247	42,510	91,330	46,540	218,004	506,114	10,334	21,068	117,530
Ag. Serv., Forestry, Fishing	(D)	319	862	(D)	91	(D)	(D)	70	(D)
Mining	2,626	16,840	40,852	16,826	93,692	236,168	(D)	1,902	45,648
Construction	(D)	5,700	11,219	4,400	54,909	97,494	916	1,418	10,659
Manufacturing	1,629	3,103	7,328	1,631	4,650	11,781	(D)	1,364	3,048
Non-Durable Goods	¹	932	3,034	¹	3,518	7,451	¹	34	(D)
Durable Goods	¹	2,171	4,294	¹	1,132	4,330	¹	1,330	(D)
Transportation	3,338	6,965	(D)	8,403	21,586	57,613	4,453	7,608	20,594
Wholesale Trade	1,787	2,132	(D)	1,334	6,788	(D)	0	525	(D)
Retail Trade	2,103	4,172	6,183	6,372	17,684	37,240	2,625	5,243	13,850
Finance, Insurance, Real Estate 605	1,341	3,146	(D)	3,652	7,257	342	682	3,473	
Services	1,503	1,938	4,766	6,481	14,952	(D)	(D)	2,256	(D)
Government	4,783	6,983	13,211	8,647	22,574	47,473	6,176	9,569	19,321
Federal Civilian	1,447	1,100	2,061	1,737	3,672	5,940	552	1,069	1,521
Federal Military	226	173	231	489	555	790	170	159	247
State and Local	3,110	5,710	10,919	6,421	18,374	40,743	5,454	8,341	17,553
Per Capita Personal Income (Dollars)	⁴	6,101	9,963	⁴	7,827	13,363	⁴	4,922	9,765

(D) Indicates the data is not printed due to disclosure.

¹ Durable and nondurable goods are included in the total for manufacturing.

² Wyoming Department of Administration and Fiscal Control 1983, Wyoming Income and Employment Report, Division of Research and Statistics, 5th edition, June 1983.

³ Bureau of Land Management 1982, Rock Springs District Social Economic Profile, Updated and Revised in 1982.

⁴ Data were not available.

and Diamondville. A substantial amount of oil and gas exploration and development was also occurring in this area during the same period. Lincoln County and the Town of Kemmerer grew 30.2 and 48.8 percent, respectively, during a three year period.

Tax Revenues

Mineral production taxes provide a major portion of total ad valorem taxes collected in the KRA. Table 3-26 shows the estimated ad valorem production taxes, severance taxes, and Federal

royalties collected on mineral production in Lincoln, Sweetwater, and Uinta counties. Ad valorem tax collections on oil production increased in Lincoln, Sweetwater, and Uinta counties from 1980 to 1982. Severance tax collections also increased in the three counties during the same period. The dramatic change in severance tax collections was partially due to an increase in the severance tax rate from four percent to six percent on crude oil production and an increase from two percent to four percent on stripper oil production.

Ad valorem tax collections on natural gas production increased from 1980 to 1982. Severance taxes increased more than ad valorem

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Table 3-25
POPULATION ESTIMATES FOR LINCOLN, SWEETWATER, AND
UINTA COUNTIES

County/Community	1960 ¹	1970 ²	1980 ²	1983 ³	1960 to 1970	1970 to 1980
Lincoln	9,018	8,640	12,177	15,857	-4.2	40.9
Afton	1,337	1,290	1,481	1,603	-3.5	14.8
Cokeville	545	440	515	580	-19.3	17.0
Diamondville	398	485	1,000	1,105	21.9	106.2
Kemmerer	2,028	2,292	3,273	4,871	13.0	42.8
LaBarge	(N/A)	204	302	527	(N/A)	48.0
Thayne	214	195	256	296	-8.9	31.3
Remainder of Lincoln	(N/A)	3,734	5,350	6,875	(N/A)	43.3
Sweetwater	17,920	18,391	41,723	44,739	2.6	126.9
Granger	159	137	177	234	-13.8	29.2
Remainder of Sweetwater	17,761	18,254	41,546	44,505	2.8	127.6
Uinta	7,484	7,100	13,021	21,478	-5.1	83.4
Evanston	4,901	4,462	6,421	10,576	-9.0	43.9
Lyman	425	643	2,284	2,918	51.3	255.2
Mountain View	(N/A)	444	628	1,123	(N/A)	41.4
Remainder of Uinta	(N/A)	1,551	3,688	6,861	(N/A)	137.8

¹ Bureau of Land Management 1982, Rock Springs District Social Economic Profile, updated and revised in 1982.

² U.S. Department of Commerce, Bureau of the Census 1981, 1980. Census of Population and Housing, Wyoming. Final population and housing unit counts, PHC80-V-52, issued March 1981.

³ Population estimates for Lincoln and Uinta counties were provided by Overthrust Industrial Association 1983. OIA Monitoring Series Projections 1983-1995. February 19, 1983. Population estimates for Sweetwater County were provided by Sweetwater County Association of Governments 1984. Sweetwater County Population Projections 1983-1992, COMPS Forecast Model, January 1984, Green River, Wyoming

taxes in the three counties during the same period. Again, this increase was partially due to an increase in the severance tax rate. The severance tax rates on coal and trona production remained constant during this period. Increased ad valorem and severance tax collections on coal in Lincoln County and trona production in Sweetwater County were primarily due to increases in assessed valuation. Taxable coal production decreased in Lincoln County and taxable trona production increased only slightly.

Federal royalties are another source of funding for State government in Wyoming and for cities and towns within the state. Fifty percent of all royalties collected on mineral production are returned to the State. Royalties collected on coal, trona, and oil and gas production in Lincoln, Sweetwater, and Uinta counties amounted to over \$46 million in 1980 and nearly \$78 million in fiscal year 1982.

Social Setting and Lifestyles

The area was inhabited by Indians, trappers, and fur traders in the early 1800s. The Lander cutoff of the Oregon Trail provided a route for settlers to reach the area. Agriculture was the initial industry to the north, and mining was the leading industry to the south. The Union Pacific Railroad passed through Evanston in 1869 and provided a means to export timber from the area. Evanston served as a railroad switching yard. Commercial coal production for the railroad was centered around the Town of Kemmerer (Institute for Policy Research, 1982).

Lifestyles were set by the early settlers. Strong Mormon influences of early settlers played a major role in setting the cultural and social structure of the region. The lifestyles and social values of residents in the Star Valley area are still somewhat characteristic of the early settlers. The area is

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Table 3-26

ESTIMATED AD VALOREM PRODUCTION TAXES, SEVERANCE TAX, AND FEDERAL ROYALTIES COLLECTED ON MINERAL PRODUCTION IN LINCOLN, SWEETWATER, AND UINTA COUNTIES (Reported in Thousands of Dollars)

	1980			1982		
	Lincoln County	Sweetwater County	Uinta County	Lincoln County	Sweetwater County	Uinta County
Coal						
Assessed Valuation ¹	58,467	72,864		77,600	171,452	
Ad Valorem Production Tax ²	3,291	4,955		5,548	12,259	
Severance Tax ³	5,316	7,651		8,148	18,002	
Federal Royalties ⁴	8	2,325		27	3,864	
Trona						
Assessed Valuation ¹		108,891			121,584	
Ad Valorem Production Tax ²		7,784			8,721	
Severance Tax ³		5,989			6,687	
Federal Royalties		6,510			8,514	
Oil						
Assessed Valuation ¹	2,482	117,848	51,297	7,574	317,944	277,534
Ad Valorem Production Tax ²	170	7,931	3,483	542	22,733	17,845
Severance Tax ³	97	4,590	1,998	447	18,759	16,375
Federal Royalties ⁵	2,807	26,569	8,082	5,264	40,843	19,433
Natural Gas						
Assessed Valuation ¹	16,591	156,846	40,346	73,599	318,835	77,788
Ad Valorem Production Tax ²	1,136	10,556	2,739	5,262	22,797	5,002
Severance Tax ³	664	6,274	1,614	4,416	19,130	4,667
Federal Royalties ⁵						

¹ Wyoming Department of Economic Planning and Development, Mineral Division 1983. Wyoming Mineral Yearbook 1983, Cheyenne, Wyoming.

² Ad Valorem production taxes calculated using the county average mill levy for each year. Wyoming Department of Revenue and Taxation, Ad Valorem Tax Division 1980 and 1982. Annual reports for 1980 and 1982, Cheyenne, Wyoming.

³ Severance taxes were calculated using 10.5 percent for coal; 5.5 percent for trona; 4 and 6 percent for natural gas in 1980 and 1982; and 2 percent for stripper oil and 4 percent for crude oil in 1982. The ratio of crude to stripper oil was assumed to remain constant for all three counties and the State.

⁴ Royalties are reported on a fiscal year basis. Mineral Division, Bureau of Land Management, Rock Springs District, Wyoming.

⁵ Federal royalties for oil and gas production are combined.

generally rural and had declining or stable population from 1940 to 1970. The area remains sparsely populated with only 3.0, 4.0, and 6.3 residents per square mile in Lincoln, Sweetwater, and Uinta counties, respectively, in 1980.

Rapid population growth was experienced in Evanston and Uinta County and, to a lesser extent, in Kemmerer and Lincoln County from 1979 to 1982. Evanston was considered a boomtown. Some of the changes in social structures and problems that take place during periods of boom growth are discussed in the Draft EIS, Coal, Green River-Hams Fork Region, Round Two (USDI, 1983), which analyzes impacts from coal leasing and development. Many new temporary and permanent residents were added to the area,

which resulted in a mixing of old traditions with new attitudes and lifestyles.

In less populated areas, the old traditions and way of life have been somewhat maintained. Ranching families have retained an outlook usually associated with rural, agrarian populations. They emphasize the importance of independence, self-reliance, and outdoor work. Ranch families cling to what they perceive as a western way of life, one which they inherited from pioneer settlers. Despite low financial returns from ranching, they persist in ranch lifestyles. In doing so, ranchers express what has been labeled "ranch fundamentalism", the belief that ranching leads to a higher state of well-being than an alternative way of life (USDI, 1982b).

CHAPTER IV

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter evaluates the environmental consequences (impacts) expected from each alternative. The impacts include those to the physical and natural environment, and also those impacts to the relationship of people with the environment. The significance of the impact, including magnitude, duration, incidence, and probability are discussed where possible. National, regional, or local importance is also discussed in some instances.

The impacts described in this chapter are estimates. In some cases, existing data were used; in others, very little data were available. Lack of data has contributed a degree of uncertainty for the impact estimates. Where relevant information is lacking or where scientific uncertainty exists, the discussion indicates this fact. In these cases, a worst case analysis has been performed.

The chapter is arranged to address impacts to all elements (air quality, minerals, soils) for each particular alternative. First, impacts are discussed for those management actions that are common to all alternatives, and then for each alternative including Existing Management. Subsections for each alternative on "Short-Term Uses Vs. Long-Term Productivity," "Unavoidable Adverse Impacts," Irreversible and Irrecoverable Commitment of Resources," and "Conclusion" include those impacts addressed in the Management Common to All Alternatives section.

MANAGEMENT COMMON TO ALL ALTERNATIVES

AIR QUALITY

Major sources and types of emissions are listed in Table 3-3. The impacts from gas sweetening plants are discussed in the final EIS for the Riley Ridge Natural Gas project (BLM, 1983). The risks to public health and safety associated with a sour gas trunkline are discussed in an addendum EA

to the Riley Ridge EIS. No significant impacts are expected from coal development (USDI, 1983).

At least four more acid deposition monitoring stations will be placed northeast of the KRA. Exxon will continue to maintain ambient monitoring stations for SO₂ and ground level sulfur concentrations near Dodge Rim and Opal Bench. The Forest Service, in cooperation with industry, will monitor and evaluate air quality related values in the Bridger and Fitzpatrick Wilderness Area.

Except for two small areas near Afton, there are no areas of high pollution potential in the KRA (Map A). From these data no areas appear to be unsuitable for locating sour gas processing facilities. Site specific analyses which would be conducted prior to permitting any such facilities may reveal air quality related problems, which would preclude siting of a facility at a particular location.

GEOLOGY AND MINERALS

For oil and gas, basic resource protection will be provided but the degree will differ among the alternatives. Standard stipulations will be applied to all Applications for Permits to Drill which include reseeding stipulations. However, the manner and degree of seeding is specified in the alternatives.

Coal decisions were made in an amendment to the Pioneer Trails MFP which is summarized in Appendix B-2. The impacts of those decisions are that new coal tracts may be leased, leading to new coal production. An analysis of this possibility, together with the environmental effects of continued production on existing coal leases, was made in the Draft Environmental Impact Statement for Coal - Green River-Hams Fork Region - Round II (BLM, 1983). Two tracts in the KRA that may be leased were analyzed. Tract 98 would result in production of 3.4 million tons of Federal coal, the change in use of about 165 acres from livestock use to mining, the generation of Federal royalties and taxes, and discovery of previously unknown paleontological resources. Depending on whether or not the pit is recontoured, either 80 acres or 160 acres would be returned to a forage production level and

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wildlife habitat condition equal to, or better than, the present. Byrne Creek tract would produce 6.04 million tons of Federal coal, with about 2,320 acres going from livestock grazing to mineral development. Federal royalties and additional taxes would be produced. Also, previously unknown cultural resources may be discovered. Ultimately, 2,230 acres of land would be returned to a forage production and wildlife habitat level equal to, or better than, the present.

Sodium decisions were analyzed in the Sodium Mineral Development Environmental Assessment (BLM, 1981). Currently about 6,561,000 tons of soda ash are being produced per year from 11.7 million tons of trona. Several scenarios were analyzed in the EA. For example, Scenario 1 anticipates a total of 15,200 acres of soil and vegetation disturbance; 7,100 acres of big game summer range disturbed; 473 AUMs lost; and 52,743 acre feet of water consumed per year. For a summary of other possible impacts under various scenarios, see the Environmental Analysis. The scenario that develops will, in part, be dependent on the changes in the national economy over the life of the plan.

The impacts from phosphate prospecting and mining, mining of salable mineral, geologic hazards, and impacts to fossils will be minimal due to existing mitigation measures, State and Federal regulations, and site-specific environmental requirements.

Locatable minerals development may impact other resources to a large extent due to several factors. Several land withdrawals are currently in the process of being revoked which would allow claims to be staked in areas previously off limits. Also, mining claims create a vested right which can interfere with and be pre-eminent over other resource uses. For example, gravel and other mineral materials cannot be sold off of unpatented mining claims. A recent gravel sale in the KRA was delayed because of mining claims. In general, once a mining claim is staked and properly recorded, the claimant has the right to perform assessment work, and mine the claim if a valid discovery is present. Although these actions would be subject to State and Federal regulations, the right to mine would still exist. The history of mining claims in the KRA shows that little, if any, activity has occurred. Part of this may be due to the withdrawals. The future level of activity will depend on the trend of the general economy and availability of locatable deposits elsewhere. Locatable deposits in the KRA do not appear to be economically minable either now or during the life of the RMP. For example, uranium does exist in some sediments but the currently depressed market and existing

operations that are idle would make development of KRA's deposits unlikely for the life of the plan. As mentioned above, however, the importance of mining claims in relation to other resources cannot be overlooked.

Short-Term Use Vs. Long-Term Productivity

Generally, mineral exploration and production would result in a decline in short-term productivity of other resources, compared to existing productivity. The level of decline will depend on the level of mineral production. Beyond the life of plan, long-term productivity may increase slightly in some coal-mined areas.

Unavoidable Adverse Impacts

Loss of vegetation (including range forage, wildlife habitat, and other vegetative cover), soils (through erosion), watershed values, recreational values, and cultural values would occur to some extent from mineral production.

Irreversible and Irretrievable Commitment of Resource

Minerals produced and the fuel used to produce them would be irretrievable commitments of resources. Cultural sites would be eliminated. However, in most cases, the important information from the site would be gathered.

Conclusion

Sodium (trona) and coal mining would not be affected by this plan. The extent of future development of locatable minerals is unknown and is anticipated to be low. It is not expected to be affected by this plan.

SOILS

Energy and mineral exploration and development and livestock grazing create the most significant impacts to the soil resource of the KRA. The types and degree of impacts are described under the alternatives because they vary by alternative. The types of impacts that can be expected and some of the potential for mitigation are described below.

Geophysical exploration is extensive in the Overthrust portion of the KRA. The impacts to the soil resource are largely due to movement of exploration equipment over the soil surface, often

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in a criss-cross fashion (Map 4). Movement not following established roads and trails leads to compaction of the soil surface, channelizing of surface water in ruts and loss of vegetative cover. These impacts are aggravated when soils are wet and yielding. Erosion susceptibility is increased along routes with steep slopes and surface disturbance. These long-term impacts can be mitigated through the use of seasonal stipulations that restrict activities to the sufficiently dry or frozen periods, thus minimizing vegetative cover loss and soil compaction. Use of portable (helicopter) seismic operations such as in Raymond Mountain WSA, would minimize over-ground traffic thus reducing compaction rates on surface disturbances. For the KRA, the amount of soil loss cannot be quantified because the locations of geophysical lines are dependent upon industry interest. Successful reclamation of exploratory disturbance would minimize irretrievable erosion losses.

The magnitude and duration of impacts associated with energy development are far greater than during the exploration phases. Removal of vegetation and exposure of bare soil due to construction of roads, drill pads, and ancillary facilities may result in accelerated wind and water erosion. The degree of erosion is dependent, in part, on slope (Figure 4-1). Cuts, fills, and stockpiles created during development are highly susceptible to erosion due to steep slopes and lack of protective cover. The length of time a well affects a watershed depends on the duration of the disturbance before reclamation succeeds. If a well is a failure (non-producer), it would produce sediment for an estimated 6 years. Producing wells have an average production span of 20 years. Assuming 5 years to revegetate, the total impact for a successful well is 25 years (USDI, 1979).

Additional impacts associated with well pad construction and development can include: damage to surrounding vegetation and soils through burial with salt affected subsoil used for fill material; sedimentation into nearby streams (ephemeral and perennial); accelerated erosion from slope failure initiated by construction; decrease on-site productivity due to mixing of soil during construction; and contamination of the surrounding watershed due to leakage from reserve pits.

The impacts from associated disturbances during well site development (i.e., pipelines, access roads and facilities) could include: increased runoff rates due to impermeable road surfaces; erosion of exposed soils on cut and fill slopes; accelerated erosion and gullying

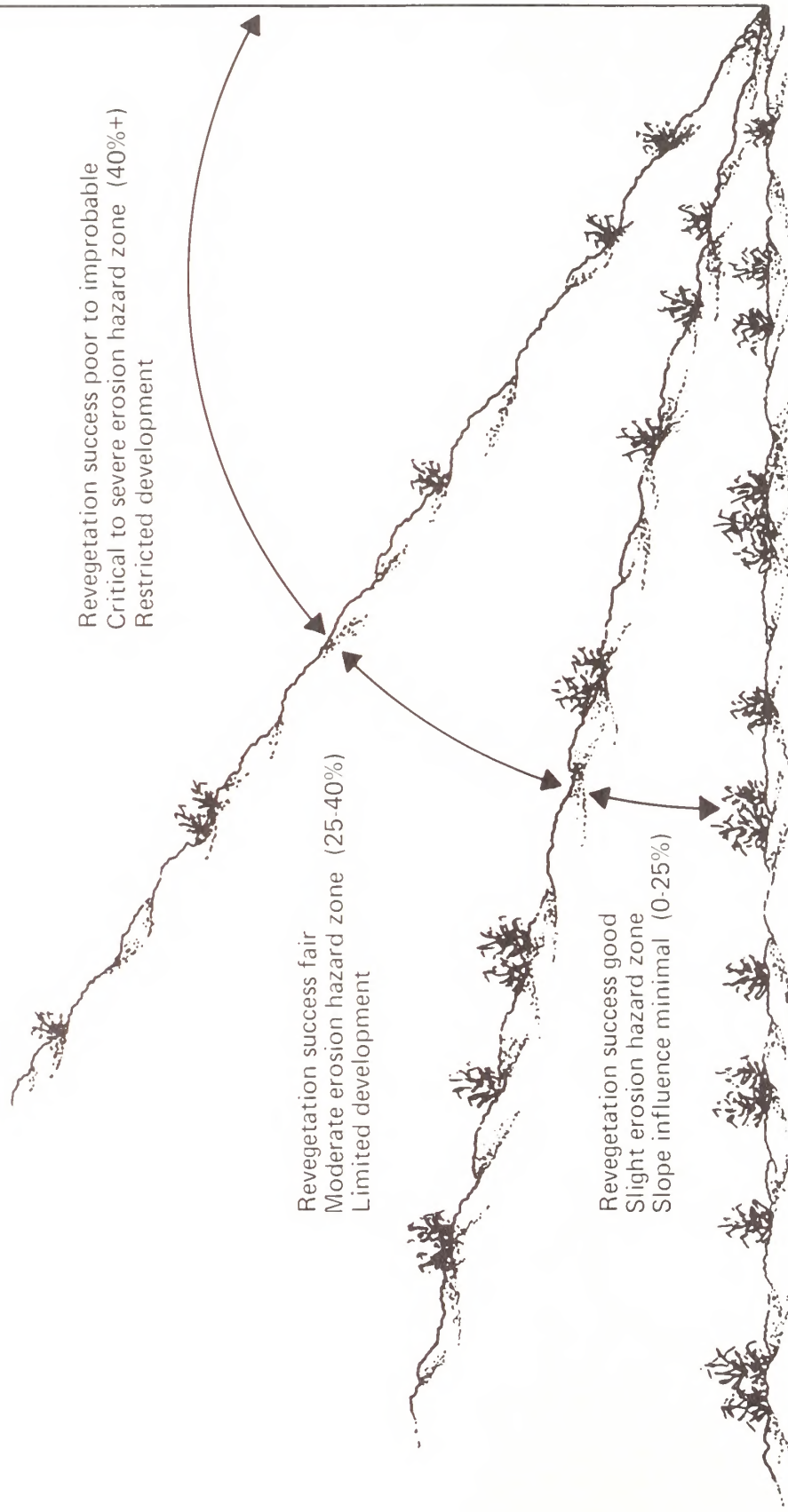
along pipeline excavations; disturbance of unstable slopes and use of frozen fill material resulting in mass wasting and increased erosion susceptibility; and use of unsuitable stream crossings, poor installation of culverts and ditches leading to accelerated erosion, and sedimentation resulting from improper culvert installation.

Areas which will not be re-offered for oil and gas lease (Raymond Mountain WSA) or which contain a no surface occupancy stipulation will not be subject to impacts from development.

Surface coal mining within the KRA would contribute to both short- and long-term increases in erosion dependent on reclamation timeframes and success. Accelerated erosion would continue until reclamation reduced rates to natural conditions. A total of 2,395 acres of coal were identified as leasable and of interest to industry. Estimates of quantifiable erosion rates cannot be made due to the lack of specific soil surveys in these areas. Due to the small acreage involved and mitigation of impacts through long-term mining and reclamation plans developed under the authority of Surface Mining and Control Reclamation Act, impacts to soil are not likely to be significant. The impacts associated with surface coal mining include: alteration of soil structure and porosity which affects permeability, infiltration rates, water holding capacity, and bulk density; a disruption of nutrient cycles and a decrease in organic matter content which affect fertility; mixing of topsoil with salt enriched or toxic subsoil which could lead to long term decreased productivity and irretrievable soil loss; and stockpiling of topsoil which may cause reductions in productivity when used for reclamation material.

The impacts associated with phosphate and sodium mining would be similar to those of coal mining if development involved surface mining. Geologic investigations indicate future development of phosphate and sodium would most likely be subsurface. Impacts to soils are not expected to be significant. Placer mining impacts include breakdown of streambank stability leading to accelerated erosion and direct sedimentation.

The most important methods for mitigating the impacts of mining and of oil and gas development involve reclamation. The duration of impacts are directly related to success of reclamation. Reduction of slope and promotion of cover vegetation are of highest importance in minimizing soil erosion. Generally, on slopes of less than 15 percent, successful reclamation can be expected, with success rates dropping



Adapted from: Oil and Gas Technical Bulletin No. 1, BLM, 1981.
Surface Operation Standards for Oil and Gas Exploration
and Development, 1978.

Figure 4-1
INFLUENCE OF SLOPE ON REVEGETATION,
EROSION AND DEVELOPMENT

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dramatically on steeper slopes (Figure 4-1). Poor distribution of topsoil and mixing with subsoils are limiting factors for reclamation. In areas of high landslide potential, the probability of mass wasting associated with disturbances, increases on steeper slopes.

Reclamation success can be limited by lack of available soil moisture, delaying or preventing revegetation especially in the 7 to 9 inch precipitation zone (soil area "U" on Map D). Reclamation success can be jeopardized in areas with greater than 15 inches of precipitation (soil area "M" on Map D) where mud pits do not dry up in one season and lack storage capacity to contain spring runoff. Contamination of soils can occur from toxic overflow from these pits and from spillage during operations.

Long-term beneficial impacts to soils can be expected from implementation of grazing systems. Systems utilizing rest during critical growing periods and redistribution of grazing away from critical areas such as flood plains, riparian areas, and reservoirs would protect ground cover and productivity, decrease susceptibility to erosion and compaction. Until areas receiving intense livestock use have grazing systems implemented, ground cover conditions and compaction will continue to degrade soils over the long term. Both the removal of vegetation and soil compaction by livestock would decrease water infiltration and increase both sediment and water yields (Rauzi and Hanson, 1966; Holechek, 1980).

Approximately 6,160 acres along stock trails may experience some accelerated soil compaction resulting in irretrievable losses of soil and diminished productivity. Loss of ground cover would increase evaporation rates from the soil (Shawn, et al., 1972) resulting in reduced soil moisture. Lack of surface moisture would seriously impede seedling development and increase susceptibility to wind and water erosion.

Construction of range improvements would cause short-term increases in accelerated soil erosion during disturbance. Range improvements would decrease impacts to soils and would help achieve long-term stability of overall watershed due to improved distribution of livestock. However, overgrazing would still occur close to water sources.

Wildfires and prescribed burns on rangelands raise soil temperature only a few degrees below the soil surface; thus, physical and chemical changes will be small. Generally, soil pH and cation concentrations increase slightly due to additions provided by combustion of above-ground biomass. Total nitrogen and sulfur

concentrations tend to decrease because they volatilize at relatively low temperatures. Nitrogen, in forms available to plants, increases because temperature-sensitive nitrogen cycling bacterial are stimulated by warmer soil surface temperatures. This effect is most noticeable following spring fires when soil warms more quickly. The most adverse effects follow fires that result in the soil remaining exposed for extended periods. Steep slopes (greater than 40%) are subject to erosion and mass wasting, as are fragile or sandy soils. In most cases, soil disturbance is aggravated by heavy equipment used to suppress wildfires.

Noxious weed and brush control through spraying would initially leave dead plant residue controlling wind and water erosion. Over the long term, increases in desirable plant species will minimize soil erosion.

Protection of wildlife habitat (forage and cover) and riparian areas will help to stabilize and improve watershed condition over the long term through protection of ground cover. Increased woody floodplain vegetative cover would help stabilize streambanks and channels due to increases in root depth and density in margins along streams, which are subject to intense water erosion. The reestablishment of riparian shrubs on 200 acres within the Thomas Fork Drainage will decrease streambank erosion rates over the long term. Implementation of HMPs through establishment of exclosures, grazing systems, vegetation treatments, or habitat improvement would all improve livestock and wildlife distribution and ground cover, thus improving soil and watershed condition.

The impacts associated with off-road vehicle use are similar to those attributed to truck-mounted geophysical exploration. Long-term compaction and gulying can result from ORV traffic due to continued use after establishment of a trail. Loss of protective vegetative cover adds to visibility of trail and to the likelihood of future use. These long-term impacts can be mitigated through use of physical trail barriers or area closures. Closure of ORV use in Raymond Canyon WSA will minimize impacts associated with off-road use.

The impacts from timber harvesting include accelerated erosion from access road construction, increased erosion susceptibility due to ground cover removal, soil compaction, and rutting along skidding trails. Impacts associated with logging access road construction are similar to those in oil and gas development, however, generally the areas logged (soil area "M" on Map D) are subject to

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greater precipitation and higher landslide potential (Map A). The use of clear-cutting substantially removes surface cover which increases erosion susceptibility and compounds the probability of slumping. Thinning and selection cutting leave most of the ground cover intact and result in minimal soil exposure. The method of yarding dictates the number of roads to be built, extent of skidding trails, and the amount of soil loss. Use of rubber tired skidders for yarding promotes the greatest detrimental impact due to rutting, compaction, and channelization. Aerial yarding systems are alternatives which do not cause these problems. On an average, 100 acres would be harvested each year within the KRA. Potential hazards of increased runoff and erosion are likely to be minimal due to small acreages involved and the use of forest management plans.

Disposal of Star Valley lands and other parcels within the KRA would not impact the soil resource except where there is a change in land use. The type of change would dictate the degree of soil loss, however, this is expected to be insignificant. The granting of rights-of-way in areas with critical watershed conditions, high potential for landslides, and high susceptibility to erosion allows development of accelerated erosion along pipelines, roads, communication lines, and sites. Such impacts can be reduced by site-specific analysis and the addition of appropriate mitigation.

Short-Term Use Vs. Long-Term Productivity

Salable minerals, principally sand and gravel will result in surface disturbance that would adversely affect the long-term productivity of the areas from which salable minerals are recovered.

Logging operations will produce diminished long-term soil productivity along skidding trails due to compaction. Any disturbance resulting in mass wasting will expose subsoils with relatively low productivity.

Areas where surface coal mining takes place will be subject to losses in long-term productivity on the sites themselves. The sites would be evaluated on a case-by-case basis and reclamation is expected to return long-term productivity to predisturbance levels.

Unavoidable Adverse Impacts

All surface disturbing activities are expected to result in some degree of soil loss. The degree and duration of soil loss is dependent on the alternative chosen. The soil loss and related

impacts are discussed under each alternative.

Irreversible and Irretrievable Commitment of Resources

Soil productivity would be irretrievably lost during life of oil and gas, and mining operation.

There would be some irretrievable soil loss due to erosion before successful reclamation occurs on all soil disturbance areas.

Any soil disturbance leading to landslides or mass wasting would result in irreversible change in topography and irretrievable soil loss.

Irretrievable soil productivity loss would occur due to compaction within stock driveways and areas of intense use caused by poor livestock distribution.

Conclusion

The impacts to the soil resource from oil and gas exploration and support activities (e.g., roads) are described under each alternative. The following activities adversely impact the soil resource: salable and locatable minerals, coal, trona, forestry, and stock trails. The impacts from these activities are often localized. They are not expected to be significant.

WATER RESOURCES

The development of the trona deposition area would be likely to result in some degradation and consumption of groundwater reserves during prospecting exploration drilling, mine shaft development, drilling of solution mining wells, and during mining operations. Potential increases in pollution of good quality aquifers would increase as solution mining increases. Seepage into groundwater supplies from tailings piles is also possible. Alterations of natural drainages for facilities and operations could cause significant local effects on the geomorphology and hydraulics of the area's stream system.

Mining of coal may lead an increase in salinity in some surface waters from mine effluent, leaching from spoils, and from the salt concentrating effects of the consumptive use of good quality water that formerly diluted poorer quality surface waters. Mining may affect local groundwater supplies but is not expected to affect regional groundwater supplies.

Other surface-disturbing activities would also add to the salinity and sediment load in surface waters.

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Short-Term Use Vs. Long-Term Productivity

The degradation of water quality in aquifers and the increase in salt and sediment loads would last beyond the surface-disturbing or underground mining activity and are expected to last beyond the life of the plan.

Unavoidable Adverse Impacts

Erosion, sedimentation, and salinity from timber haul roads and mining activities may be introduced into surface waters. However, as long as the best management practices are followed and reclamation adhered to, this impact would be minimized. The impacts from timber haul roads and other forestry operations would be short term. The impacts from mining could be either short term or long term, depending on the length of time the mining activity takes place.

Irreversible and Irretrievable Commitment of Resources

Some groundwater aquifers may be irretrievably committed because their quality

may be degraded to a point where the water would not be usable for all the same previous uses.

Conclusion

On a regional scale, water resources would only be minimally affected. Most effects would be localized or short term.

LIVESTOCK MANAGEMENT AND VEGETATION

Some disturbance to livestock management from mineral activities would be encountered regardless of the alternative chosen (except Alternative D). However, most long-term impacts would be mitigated through the permitting process so that the net effect to livestock in the KRA as a whole is negligible. Once a surface disturbance occurs, the impacts from the reclamation program are primarily beneficial. Through reclamation, the effects of surface-disturbing activities are partially mitigated, thereby reducing the adverse impacts to

Sheep trailing on the B-Q Trail



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livestock management through loss of vegetation.

Road construction impacts to vegetation and livestock management may be partially mitigated through reclamation. However, the long-term effects of new, permanent roads cannot be mitigated. The impacts include removal of forage and potential conflicts between livestock operators and users of the road. To reduce the potential for confrontation, permittees may be forced into changes in management practices.

BLM's participation in county weed and pest control programs would result in moderately beneficial impacts to livestock management, especially when viewed in light of a county-wide program.

As described in the Soils section, adverse impacts to soils would occur on stock trails. However, use of trails greatly enhances supervision of livestock and minimizing adverse impacts to forage resources from soil compaction.

The KRA predator control program is also primarily beneficial. This program deals mainly with coyote control on sheep ranges. The predator control program provides significant economic benefits to the local sheep industry by reducing the number of sheep killed by predators.

The ultimate removal of all wild horses (1984 estimate of 62 head remaining) within the KRA would be beneficial to livestock and ranchers. Removal would reduce competition with livestock for forage and water. In addition, there would be reduced maintenance required on range improvements (fences, etc.) because damage by horses would be eliminated.

ORV use would continue to cause isolated incidents of harassment of livestock and leaving gates open.

Impacts from the Lands program, through land disposal, rights-of-way, etc., would affect all but Alternative D. These impacts are discussed under each alternative.

There are no significant adverse impacts to livestock management from the forestry program. Long-term impacts are generally beneficial and short-term impacts can be mitigated.

Short-Term Use Vs. Long-Term Productivity

Adverse impacts from short-term uses are, for the most part, mitigated. Long-term productivity would remain stable or increase slightly.

Unavoidable Adverse Impacts

Some disturbance to vegetation as well as livestock operations would occur as a result of geophysical exploration. A limited amount of forage would be lost as a result of facility construction. Locally significant harassment and disturbances of livestock would occur from ORV use.

Irreversible and Irrecoverable Commitment of Resources

Some sites, such as selected roads may remain disturbed, resulting in an insignificant loss of vegetation.

Conclusion

The impacts to livestock management are described under each alternative. The impacts from the various management activities common to all alternatives may be locally significant. These impacts are, however, mostly mitigated through each program.

FISH AND WILDLIFE HABITAT

Geophysical exploration impacts wildlife by disturbing animals during crucial periods and by surface disturbance resulting from trucks and surface blasting. Disturbance to wintering big game herds causes stress when animals are already in a stressed condition resulting from a negative energy balance (i.e., they use more energy than they consume). If disturbance is significant enough, displacement can result causing animals to be forced into areas of less desirable forage or shelter. This may increase winter mortality of adult animals and cause lower birth rates and survival of young.

Studies have shown that elk move in response to exploration activities in forested areas, where escape cover is not limited (Knight, 1980). In open sagebrush-grassland, topography must often serve as the only available escape cover, making the impacts from disturbance more severe. In addition, helicopter activity involved with portable operations, which are common in the Overthrust Belt, can temporarily displace big game from preferred habitat (Horejsi, 1979). Disturbance during the breeding season (March-July) may also impact sage grouse, raptors, and other birds by causing disturbance to mating areas, abandonment of nests, or mortality of young by interrupting parental care (i.e., feeding,

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providing shade, etc.). Destruction of riparian vegetation, increased sedimentation, and bank erosion may result when truck-mounted equipment crosses drainages at non-established sites or explosives are set too close to the stream channel.

Seasonal restrictions protect important habitat during the construction phase and allow animals to slowly become accustomed to disturbance; however, impacts from human activity will occur during the operation phase for the life of the well or road. Many oil and gas leases within the resource area were issued prior to 1976 and do not contain any stipulations to protect wildlife habitat. Adverse impacts to riparian areas result when oil and gas wells or roads are constructed adjacent to riparian areas causing sedimentation and a deterioration of fisheries habitat.

Specific changes in big game populations from livestock grazing proposals are based on predicted changes in AUM levels and are estimated under each alternative.

Timber harvest and woodcutting impact wildlife habitat by removing cover and setting back succession to the grass/forb stage. This can benefit big game and other species by creating "edge effect" and improving forage areas. It can also be an adverse impact in areas where cover is limiting, especially for elk. Many timbered areas on public land are small in size and barely provide adequate cover for elk. Clearcutting these stands would reduce local elk populations. Timber harvest near riparian areas increases sedimentation in streams and can reduce habitat quality.

Unrestricted ORV use reduces available security areas for big game. This reduces the number of big game which will use an area.

The disposal of public land can adversely impact wildlife habitat by changing use patterns from multiple-use to single-use such as residential or mineral development. Land exchange disposals can benefit management of wildlife by consolidating acreages in the Forest Service or other agency.

The impacts of rights-of-way management to wildlife habitat are generally similar to those described under the oil and gas impact section. The impacts are dependent upon restrictions placed on the grant which vary by alternative.

Impacts to wildlife from existing and potential coal development were analyzed in the Coal Amendment to the Pioneer Trails MFP (USDI, 1976a). Important raptor nesting areas, big game winter range, and other wildlife habitat were identified as unsuitable for mining, or mitigation

measures were developed to reduce possible impacts to wildlife. Mitigation for wildlife will be included in mine plans for new mines. Similar stipulations and mitigations were included in an MFP amendment on sodium (trona) mining.

Short-Term Use Vs. Long-Term Productivity

The populations of most big game species are currently at, near, or above Wyoming Game and Fish objective levels. The actions described as Management Common to All Alternatives are not expected to affect the productivity in the KRA to lower these numbers. The populations of other fish and wildlife species in the KRA are also not expected to be reduced.

Unavoidable Adverse Impacts

Areas where surface-disturbing activities take place would be temporarily removed as wildlife habitat. There may be some additional road kills of big game where human population or traffic increases.

Irreversible and Irretrievable Commitment of Resources

While some areas may be committed to other uses well beyond the life of this plan, none are expected to be irreversible or irretrievable.

Conclusion

Many of the activities described in this section will cause short-term wildlife movement, loss of habitat, and other short-term losses. None of these are expected to be significant or long-term. Big game numbers are expected to remain at or above Wyoming Game and Fish objective levels.

LAND RESOURCES

Land tenure adjustment is analyzed under the alternatives. Each proposed land tenure adjustment is analyzed on a site-specific basis.

Rights-of-way will continue to be processed with stipulations attached to the rights-of-way. These vary by alternative and affect the kinds and levels of impacts.

Short-Term Use Vs. Long-Term Productivity

Land disposal creates a loss of public land acreage for use by BLM licensed livestock.

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Depending upon the ultimate use after disposal, wildlife habitat, soil, and vegetation could be impacted. If subsequent use is for housing development, then impacts to the above resources could be long term. However, if the land would continue to be managed for its present use, no loss of long-term productivity would occur.

Under all alternatives, mitigating measures would be attached to right-of-way grants. Short-term impacts would occur but over the long term, productivity would be returned to near present levels.

Unavoidable Adverse Impacts

Some land uses could result in the loss of some vegetation, and adverse impacts to visual resources. Soil erosion would occur in the areas of permanent access roads or easements.

Irreversible and Irretrievable Commitment of Resources

On all types of land disposal, except for recreation and public purposes, the ability to manage the lands for public purposes would be lost to the Federal government.

Conclusion

The impacts to the lands resources are, for the most part, dependent on the alternative.

CULTURAL RESOURCES

Most, but not all, surface-disturbing activities in the KRA are preceded by a Class III (100 percent) pedestrian inventory to identify all cultural resources. Exceptions occur in previously disturbed areas, in areas covered by prior Class III surveys, for projects that disturb little or not surface (e.g., some fencelines), or for projects occurring in areas demonstrated to be of low potential for containing cultural resources. Existing Management tends to identify most sites of cultural significance.

Adverse impacts to cultural resources would continue to occur from trespass actions, illegal collecting and vandalism, inappropriate stipulations, and failure to recognize or report important sites, and natural and accelerated erosion.

Short-Term Use Vs. Long-Term Productivity

Cultural sites are non-renewable. When a site is discovered and it can remain intact, information can be recovered from it for a long period of time. When a site is discovered and reported during a surface-disturbing activity, it is often salvaged rather than left intact.

Unavoidable Adverse Impacts

Cultural resources will continue to be lost due to the same causes as in the past.

Irreversible and Irretrievable Commitment of Resources

All cultural sites that are disturbed without recovery of the information they contain are irretrievable.

Conclusion

The management of cultural resources is mainly directed at reacting to surface-disturbing activities. Some cultural sites are lost but many are identified and either avoided or recovered. Other sites are stabilized, protected, and "developed" for public information and interpretation purposes.

FORESTRY RESOURCES

The actions prescribed in the Management Common to All Alternatives have limited impacts to the forestry program.

RECREATION

Recreational activities such as hunting, fishing, picnicking, camping, horseback riding, snowmobiling, and ORV use will continue to take place throughout the KRA under all alternatives. Recreational opportunities will be emphasized in these dispersed recreation activities because it is unlikely that funding will be available to develop any recreation sites.

Oil and gas exploration and development will continue to be the greatest sources of impact

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to recreation potential and opportunities. These impacts will be described under each of the alternatives.

The recreation area management plan (RAMP) being developed for the Oregon and Mormon Trails will improve BLM's ability to manage and protect the unique values of the trails in the KRA. Interpretive signs at the Alfred Corum and Nancy Hill graves and at the nearby ruins of the Sublette Trail will enhance appreciation of these resources by the public. Acquisition of legal title for Emigrant Springs and related actions will facilitate management and appreciation of the site.

Development of a RAMP, acquisition of legal access to the mouth of Raymond Canyon, and development of a campground and parking area would help maintain primitive values and enhance public use of the Raymond Mountain WSA until Congress determines wilderness suitability.

Access for logging operations may change primitive recreation values in some areas to values associated with roaded natural areas.

Rights-of-way may be routed to either preserve or to provide access to sites with recreation potential. In general, oil and gas operations would increase access to sites with recreation potential.

Short-Term Use Vs. Long-Term Productivity

Overuse of the resources of the KRA from dispersed recreation activities is not expected. Actions that may take place in the KRA are not expected to affect the long-term capability to provide recreation opportunities. No long-term impacts are expected from the issuance of any special recreation permits.

Unavoidable Adverse Impacts

No unavoidable adverse impacts are expected due to actions identified under Management Common to All Alternatives.

Irreversible and Irretrievable Commitment of Resources

No irreversible and irretrievable commitment of resources is expected due to actions identified under Management Common to All Alternatives.

Conclusion

Recreation resources would not be

significantly impacted from actions identified under Management Common to All Alternatives.

FIRE MANAGEMENT

The impacts of fire management actions are analyzed under the alternatives.

SOCIOECONOMICS

Mineral exploration and development is important to the KRA's socioeconomic health (as shown in Tables 3-22 and 3-24). These activities are not expected to be meaningfully impacted by the proposed management alternatives. Production of oil and gas is expected to continue to expand at an annual 5 percent rate, and no extensive expansion of coal mining activities is anticipated during the analysis period. In addition, the KRA's forestry industry is not expected to be affected by the proposals, and production should continue at past levels. Range conditions on "M" and "C" category allotments would be maintained under all alternatives.

Social and economic impacts resulting from the alternatives are expected to affect, and to come largely from, the livestock and recreation sectors. Availability of AUMs for livestock use proposed within the alternatives would result in impacts on livestock sales and, subsequently, on ranch and regional income and employment. Further, regulating the availability and distribution of livestock AUMs, as indicated by some alternatives, is anticipated to impact wildlife habitat and related wildlife populations. This, in turn, would be reflected in the number of hunter recreation days available throughout the KRA during the life of the plan. Available recreation days estimated for each alternative influences projected levels of regional income, business activity, and employment.

Since management actions specified for the livestock and recreation sectors are the only ones expected to produce measureable socioeconomic consequences, these sectors will be the only ones discussed in the following analysis. In addition, it is assumed for this RMP that major changes and management activities would occur only in the livestock and recreation sectors on the "I" category allotments. Management activities on the "M" and "C" category allotments would remain basically unchanged. Therefore, this analysis deals with socioeconomic impacts related to "I" category allotments over a 50-year planning period. Other

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economic sectors will be assumed to remain unimpacted and will constitute constants in the analysis.

It is further assumed that economic and social interrelationships are unchanged over the life of the plan and that mitigation measures have been accounted for and reflected in the impacts specified for each alternative. Consequently, such impacts are regarded as unavoidable.

Although there are annual, average impacts assumed during the adjustment period, post-adjustment levels are regarded as long-term impacts remaining for as long as the plan is in affect. The impacts are not irreversible because a modification of the plan could result in sector activities and the general economy eventually approximating current levels. However, benefits foregone under any of these alternatives are irretrievable, regardless of any future plan modifications.

EXISTING MANAGEMENT

This alternative considers the continuation of current management direction. It would continue present management practices and levels of resource use. This alternative would reflect only the changes necessary to respond to the requirements of new regulations and changing national policies. This would be the "No Action" alternative.

AIR QUALITY

Under existing management, some adverse impacts to air resources are occurring. These impacts occur in a controlled manner and are minimized. BLM has approached the management of the air resource by balancing the advantages of growth in the KRA with the need to preserve natural resource values. Map A shows pollution potential in the KRA. The pollution potential was derived by applying air quality modeling techniques.

Short-Term Use Vs. Long-Term Productivity

During construction and drilling of oil and gas wells, pollutants such as total suspended particulates (TSP), NO_x , and SO_2 are released in relatively small amounts for short periods. These pollutants may cause some slight localized impacts to the air resource and visibility, but for the most part, leave no lasting impact on natural

ecology. Other industrial construction in the resource area results in much the same chain of impact events to air resources. Controlled burning for range or forest improvement also results in the addition of relatively small amounts of particulate (smoke) being released to the atmosphere for short time periods. Although this could effect visibility and slightly inconvenience some local residents, the impacts from controlled burns are localized and of short duration. During seasonal hunting use, air resource impacts are increased due to increased vehicle miles traveled by hunters, but, traffic is so dispersed as to generally cause insignificant impact.

Under Existing Management, BLM has required oil and gas operators to submit and follow accidental H_2S release contingency plans. These plans would be executed during unforeseeable and very unlikely events, such as well blowouts. They are designed to reduce impacts to short term events. If these plans are successful no irreversible impacts, such as loss of life, would occur unless someone is in the immediate vicinity of a well when a blow out occurs. At worst, there would be restrictions on entering some well areas for short periods of time, and some short term addition of H_2S or SO_2 to the atmosphere. The highest likelihood of toxic releases of H_2S in populated areas would be in the Evanston area where the Yellow Creek Field and an area of high landslide potential coincide (Map A). However, pollution potential is low to moderate and the only problems that could be expected would be those that occur immediately after an accidental release of H_2S . The percentage of private land in this area is very high. This limits the amount of control BLM can exert over development.

Oil and gas development does not affect long-term productivity as far as the air resource is concerned since impacts subside as soon as short term use (i.e., production) stops. Under Existing Management, the increases in population expected due to planned developments would result in minimal adverse impacts to the air resource.

Unavoidable Adverse Impacts

Increases in the concentrations of various air pollutants would occur. There would also be decreases in visibility in some areas.

Irreversible and Irretrievable Commitment of Resources

Planned natural gas sweetening plants would,

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by current estimates, result in the addition of sulfur to the watersheds of the Jim Bridger and Fitzpatrick Wilderness Areas. Although estimates of the amount of sulfur being added to the atmosphere vary greatly as well as estimates of its impact, it is possible that some loss of buffering capacity to alpine watersheds may occur. As these watersheds lose buffering capacity, the ecological systems they contain would become more and more susceptible to adverse impacts from acidification. It can be assumed that under existing management, a small amount of this buffering capacity is and would continue to be lost.

Conclusion

Adverse impacts to the atmosphere would be experienced in localized areas. This would manifest itself in reduced visibility and annoyance during inversion events and some reduction of air quality during all seasons where vehicle traffic is high and many residential fireplaces are in operation. If Map A shows the interaction of H₂S areas, geologic hazards, areas of high pollution potential, and populated areas.

Although air quality would be reduced, unacceptable adverse impacts (e.g., violation of standards) are not expected because all major projects generating air pollutants would be evaluated on a case-by-case basis. These analyses would help modify the project, mitigate impacts, or result in denial of the project if unacceptable potential impacts are identified. The cumulative impacts from H₂S developments in the KRA are not expected to be significant.

GEOLOGY AND MINERALS

Oil and gas development would be subject to seasonal stipulations which are applied to new leases as they are issued. The delays are temporary in nature and exceptions can be made in any given year. For example, if a crucial big game winter range was found to be devoid of wildlife, development would be allowed. Not all oil and gas leases contain such restrictions because some leases were issued prior to development of the stipulations (the stipulations are not applied retroactively). However, as time passes, more and more leases would have the stipulations attached prior to the issuance of new leases.

For some oil and gas leases, acreage is

removed from surface occupancy by "no surface occupancy" stipulations. Exceptions may be made on a case-by-case basis but the change must be authorized in writing. "No surface occupancy" can result in increased drilling costs since directional drilling, which is more costly than conventional drilling, is required. In the Overthrust Belt, directional drilling is extremely difficult due to the complex geology.

In the Raymond Mountain Wilderness Study Area (WSA), new leases for oil and gas are not being issued renewed as a result of a Secretarial decision and appropriation act language. As leases expire, more and more of the WSA will be unavailable to leasing, resulting in less area available for development until Congress decides on wilderness eligibility for the area. For areas in the WSA still open to development, stringent stipulations would be applied to proposed well sites, adding to the cost of wells in the area and probably causing time delays.

When oil and gas wells are proposed in areas with H₂S gas potential, a safety contingency plan is written which results in some added expense for the company. The requirement that well sites be reclaimed results in varying costs to the developer. These costs depend on topography and other site-specific factors.

Geophysical lines are restricted by stipulations in certain areas. The stipulations are similar to those on oil and gas leases. They are seasonal in nature and result in delays of up to seven months, depending on weather conditions and movements of animals. Exceptions are made to the stipulations on a case-by-case basis, except for hunting season and domestic sheep lambing area restrictions which are generally enforced without exceptions. In the Raymond Mountain WSA, only portable (helicopter) geophysical lines are allowed, resulting in higher costs for companies (compared to truck-mounted operations).

Stipulations attached to plans of development for placer mining in riparian areas would have minimal impact on the activity. Very little demand for placer mining is anticipated.

Keeping other mining activities out of riparian areas would have little impact on such activities, since most are already occurring outside the riparian areas.

Short-Term Use Vs. Long-Term Productivity

In the short term, approximately the life of this plan, mineral exploration and production would

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supply necessary mineral resources to the economy, to the short-term detriment of some resources such as wildlife. However, rehabilitation of disturbed areas would, in the long term, restore some of the productivity lost by other resources. Meanwhile, some mineral activity such as oil and gas production may be declining in the long term. In summary, the short-term benefits of mineral use would cause an immediate short-term loss for some resources productivity which would gradually be restored over the long term.

Unavoidable Adverse Impacts

Stipulations attached to oil and gas leases would result in delays and increased costs to operators. These costs are not expected to make the mineral resource uneconomical to recover.

Irreversible and Irretrievable Commitment of Resources

Minerals produced, such as oil and gas, constitute irretrievable commitment of resources. Fuel used in exploration and development activities is also essentially lost.

Conclusion

The oil and gas resources would be developed. There would be no areas that would be withdrawn from leasing other than the Raymond Mountain WSA (pending Congressional action). Short-term delays or additional expenses may be incurred by developers to reduce adverse impacts or irretrievable commitments of other resources. Some short-term use for mineral development would result in irretrievable commitments of such resources as soils and wildlife.

SOILS

The rate of geophysical exploration within the Overthrust Belt of the KRA is likely to continue at the present level of approximately 1,000 miles of line per year. Under Existing Management, operators determine moisture (muddy) conditions, often after serious soil disturbance damage has occurred from truck-mounted operations. Minor soil compaction rates from vehicular traffic during dry periods compounds into channelizing ruts. Excessive compaction and ground cover loss result when soils are saturated and subjected to truck operations. Existing

management practices allow incidents of vehicular damage and accelerated erosion due to compaction and ground cover loss to continue, especially during the spring and fall of the year. The lack of restrictions on riparian zone crossings has accelerated streambank instability and erosion due to breakdown of high banks and loss of streamside vegetation.

In determining oil and gas development impacts, past well data has been used to reflect current management impacts and future trends. Short and long-term cumulative impacts from well development were estimated in the Kemmerer Oil and Gas EA (Appendix G).

The Musgrave equation (BLM Manual 7317.22A) was used to estimate soil loss occurring on the erosive portions of drill pads in the Overthrust Belt (3 acres) and the Green River Basin (2 acres). Limitations associated with universal soil loss equations are documented (Gebhardt, 1981; Wischmeier and Smith, 1978). Calculations show an accelerated erosion rate of up to 270 tons per year for a pad in the Overthrust Belt while Green River Basin pads can lose up to 110 tons per year. This estimate is a worst case for erosion from well pads. Appendix G shows the method of calculation for erosion and acres of disturbance from projected access roads.

There are no restrictions on leasing on excessive slopes or in areas of known landslide potential. However, there are restrictions on development in areas of steep slopes. Since slope is an important consideration in determining whether or not successful reclamation of a site can be achieved (Figure 4-1), jeopardizing reclamation efforts at the leasing stage can occur. Field observations indicate that reclamation of slopes from 15 percent to 30 percent is difficult and such slopes have not been consistently reclaimed within the KRA (USDI, 1979). If reclamation procedures are properly designed, they should yield more successful results in the future.

Irretrievable soil loss can be expected from some sites within this slope range, past the normal 5-year revegetation period (if reclamation is unsuccessful). The impacts that can be expected from one well during a year (well year impacts) and total soil erosion would increase over those described in Appendix G on these sites. Failure of contractors to adhere to the standard stipulations compounds the above problem and contributes to reclamation failure and increased time of exposure to erosive agents. In areas of high landslide potential (Map A), likelihood of construction triggering slippage (especially on toe slopes) increases, landslide loss is permanent and not reclaimable, leading

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to irretrievable loss of soil and productivity.

Use of native species in revegetation efforts often leaves a site exposed for several seasons until desired vegetation and density is achieved. Present timeframes for reclamation achievement allow latitude for noncompliance, resulting in longer impact duration. Lack of livestock and wildlife grazing exclusion may promote reclamation failure, through utilization before stabilization. In areas with saline and alkaline soils, reclamation can be severely hampered due to poor germination and seedling establishment. All the above limitations result in irretrievable loss of soil, dependent on time of exposure before successful reclamation.

Loss of streambank stability and direct sedimentation associated with placer mining would not be significant due to the small number of placer claims. Those areas stipulated for no surface occupancy (such as Raymond Mountain WSA) would have no direct impacts on soils due to development constraints.

Generally, livestock grazing impacts to soils would be extensive due to the intensity of use, the lack of grazing systems, and the lack of new range improvements promoting watershed protection. Approximately 5,000 acres of vegetation manipulation would be conducted under this alternative, resulting in short-term increases in erosion followed by long-term increases in ground cover and stability. Continuation of existing livestock management practices within the KRA would impact soil through trampling displacement, soil compaction and loss or change in protective vegetative cover. Since these factors influence erosion rates and sediment yield, soil stability trends would continue at present levels. Over the long term, due to continuation of five AMPs and the associated range improvements, livestock distribution would provide more uniform forage use, resulting in a gradual improvement in watershed condition in these areas. Riparian areas (outside AMPs) with declining trend, will continue to experience loss of stability due to trampling, continuous grazing and early season turnout. Three of the AMPs would experience accelerated watershed improvement due to use of rest rotation grazing systems.

Vegetation manipulation through prescribed burning would cause localized short-term impacts to physical and chemical characteristics of soils, increasing erosion susceptibility through the loss of both ground cover and litter accumulation. In the long term, vegetation would increase over preburn production levels which would minimize the erosion hazard. Beneficial

impacts associated with wildlife habitat management would continue under this alternative. Use of constructed and designated equipment crossings in riparian areas would minimize logging impacts to streambank stability and avoid excessive bank erosion.

Due to the "open" and "unlimited" ORV designation, potential exists for significant erosion impacts along trails experiencing compaction and increased runoff rates. ORV closures in Raymond Canyon and the IGO Speedway would provide protection in these areas which are characterized by steep slopes.

The impacts associated with land disposal would continue to be dependent on any change in land use. The lack of year-round avoidance areas in right-of-way development would allow accelerated erosion to occur along pipelines, roads, communication lines, at sites, especially in areas with high potential for landslides and critical erosion condition.

Short-Term Use Vs. Long-Term Productivity

Due to the provision which allows the operator to determine muddy conditions, the potential for geophysical operators to cause rutting and excessive compaction would continue. This would be associated with decreases in long-term soil productivity in areas of disturbances.

Soil productivity on reclaimed areas (whether oil and gas or mining disturbance) would be variable and dependent on soil characteristics, reclamation procedures, and treatment of topsoil. In areas with slopes greater than approximately 25 percent slopes, reclamation returning disturbance to original contours would probably be poor, diminishing potential soil productivity through loss of topsoil. Grazing within newly reclaimed areas would tend to compact friable surfaces altering germination potential and root growth.

Continuation of five AMPs would increase overall long-term soil productivity through better distribution within the allotments (especially those incorporating rest rotation). Short-term soil loss due to vegetation manipulation and construction of range improvements would lead to long-term increases in soil productivity through protection and improvement of surface cover (increased distribution and increases in grass species).

Short-term ORV use under an "open" and unlimited designation may lead to long-term losses in soil productivity in some areas.

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Unavoidable Adverse Impacts

Soil productivity losses would occur when development removes vegetation or topsoil due to lack of organic matter enrichment or ensuing erosion of surface horizon. Vehicular travel off existing roads would compact soil surface.

Irretrievable and Irreversible Commitment of Resources

Soil erosion initiated by development (oil and gas, mining, and construction) or disturbance (geophysical and livestock use) would result in irretrievable soil loss. Landslides caused by development would result in irreversible loss of productivity and change in topographic composition. Soil erosion associated with these landslides produces irretrievable soil loss which would continue until natural revegetation occurs.

Conclusion

The most important impacts are loss of productivity and soil associated with unsuccessful reclamation. Short-term increases in erosion would result from burning, spraying, and mechanical treatment associated with grazing, watershed, and wildlife management. These impacts are not likely to be significant, with long-term benefit derived from increased ground cover and reduction of erosion below existing levels.

WATER RESOURCES

In general, geophysical (seismic) operations, especially shothole and vibroseis, increase erosion and downstream sedimentation. This increase in sediment load also occurs from soil compaction resulting from repeated travel of heavy equipment. Compaction increases surface runoff amounts which in turn increases erosional rates and channel sedimentation. This type of disturbance is usually short term but can result in high erosional rates under certain soil, vegetation, and slope conditions.

Shothole operations would also impact groundwater. When shotholes are drilled, they are frequently in areas of perched watertables and shallow aquifers. When improperly plugged or left "open", these holes allow waters of varying quality and from different aquifers to mix and possibly further degrade water quality. If adequate head pressure is maintained, groundwater is forced to the surface where it

may mix with surface water and make it unsuitable for livestock watering or other uses. The extent of pollution of groundwater due to drilling activities may be more far-reaching than the pollution that may occur due to coal mining.

The impacts to the water resources in the KRA from oil and gas exploration and development would be significant. It is estimated that from 1978 to the year 2000, up to 115,668 tons of sediment would be lost from the overthrust region and up to 294,444 tons from the Green River region. (These values are based upon 270 tons/well/yr. for wells in the Overthrust and 110 tons/well/yr. for wells in the Green River Basin.) The estimates are worst case estimates from well pad erosion. Erosion would also occur from access roads, landslides resulting from construction, and channel scour.

Other oil and gas impacts on water resources may result from reserve pit failures, oil and chemical spills, and water injection. However, these are rare. Approximately 34 reserve pits are expected to fail from 1984 to the year 2000. Impacts from this range from increasing salinity loads downstream to long-term impairment of water sources for wildlife, livestock, and human consumption. Oil and chemical spills may also impair water quality for a considerable length of time and may affect a much larger area if in a perennial drainage. The number of spills in the KRA averages between 5 and 10 annually. This is expected to continue. Water injection during secondary oil recovery may create groundwater problems due to intermingling of groundwater among various aquifers. Proper downhole engineering should prevent such problems. In some cases, water used for injecting causes localized depletions of ground or surface water for multiple use. Water injection is presently being used in some oil and gas fields north of Evanston.

Erosion is reduced after reclamation but the extent depends on mechanical erosion control, soil fertility, slope, and the length of time it takes to establish vegetation. Presently vegetation establishment has been highly variable with a good portion of the reclamation efforts showing only fair results. Large quantities of sediment and nutrients are delivered to the channel, at which time channels are scoured, water tables are lowered, slow moving or standing water is depleted of dissolved oxygen, and reservoirs downstream are filled in prematurely.

Continuation of present livestock management in the KRA would impact water resources through soil compaction, loss of vegetative cover and increased surface runoff. The main areas

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being affected by the above factors are generally the riparian zones. Studies have shown that any grazing on a watershed usually results in overgrazing of the riparian zones and bottomlands due to the high palatability and moisture content of the vegetation, and the closeness to water. When this occurs, the soil is compacted, vegetation is reduced, and erosion is accelerated. Initially, sediment is delivered to the channel by rill erosion but as grazing pressure continues, vegetative cover is reduced, and rills and gullies develop which degrade the water quality and bank stability, and promotes water table lowering.

Other problems which exist from livestock management are high bacteria (including coliform) counts and increased sedimentation from vegetative conversions. Vegetation manipulations and conversions have been utilized in the KRA. Both have increased sedimentation levels in the short term and, in the long term, yield less sediment than before treatment. In waterways where livestock graze, coliform levels increase. The livestock do not have to be in direct contact with water as runoff water flowing into the channel elevates the coliform levels. The bacteria are transported directly by runoff water or attached to sediment particles.

Riparian zones, where they exist, help filter out sediment and debris from surface runoff before entering the stream channel. Unfortunately, in the KRA, the riparian zones have been severely impacted from overgrazing, oil and gas development, and the drop in water table due to head cutting problems. As a result, water quality has degraded due to sediment increase and in some cases has become unfit for human consumption and other possible uses.

Under Existing Management, ORVs are under no restrictions except in the Raymond Mountain WSA. Because of that, areas of off road travel experience varying degrees of erosion since the impact depends on the severity and intensity of use. In more frequently used areas, vehicle trails tend to be the main cause for erosion since they channelize the increased surface runoff from the compacted and semi-denuded soil. As a result, the downstream water quality is degraded and further problems, like bank sloughing and headcutting, develop which worsen the present situation.

In the Raymond Mountain area, influences from ORV travel and other impacts are minimized due to interim management for wilderness. As a result, water resources are somewhat protected. However, if use in the area increases

due to wilderness designation (increase visitor use) or non-designation (ORV use, oil and gas exploration), water quality is expected to degrade.

Short-Term Use Vs. Long-Term Productivity

As a result of oil and gas exploration, short-term impacts to water quality would be from accelerated erosion from the road system. If the roads are properly engineered and properly located, the impact would be short-lived. However, these impacts to the riparian and wetlands from exploration and unrestricted grazing could result in long-term water quality problems in that the stream channel may regrade itself and result in a sustained sediment load until a dynamic equilibrium is reached.

Long-term impacts may be realized to the groundwater as a result of drilling and waste water injection.

Unavoidable Adverse Impacts

Any seismic operation, especially the shot hole vibrosis would create an erosion problem from the pad as well as a possible problem to the aquifers the hole may penetrate. Rehabilitation of surface disturbances would reduce long-term erosion. The damage to the riparian areas would be difficult to retard. Once channels are disturbed, very often a chain reaction continues both up and down the drainage which can realign the channel and cause incision.

Livestock grazing may result in chronic problems to riparian areas including increased sedimentation and salinity.

Unrestricted ORV travel would create some sedimentation problems.

Irreversible and Irretrievable Commitment of Resources

Although much can be done to alleviate channel perturbation as a result of livestock overuse or seismic activity in the riparian zone, once a channel starts regrading itself, it would continue to realign itself. In short, it will start to incise and change its channel. Therefore, once a channel is damaged, one can expect that the stream would never be what it once was.

Groundwater, because of its "out of sight" status can be very difficult to monitor. Therefore, any changes in an aquifer due to seismic activity or waste water injection may go undetected for some time. Even if a change were detected in

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water quality or the physical parameters of an aquifer, very little if anything could be done about it other than to stop operations.

Conclusion

Existing Management may result in significant impacts to water quality because of the lack of measures to reduce surface disturbance near live waters and the lack of restrictions in landslide prone areas.

LIVESTOCK MANAGEMENT AND VEGETATION

Under Existing Management, approximately 162,000 AUMs of active grazing preference are available for grazing by livestock. Of this amount, however, approximately 124,000 AUMs are licensed as active use and the remaining 38,000

AUMs are applied for as non-use.

Geophysical exploration may impact lambing areas. However, these areas are currently protected from disturbance by no occupancy restrictions placed upon the geophysical companies during the critical portion of the sheep lambing season. A small quantity of vegetation would be disturbed when exploration is allowed in these areas as a result of seismic vehicles and explosives. Some disturbance of livestock may occur in parts of the KRA due to geophysical exploration, but is mitigated by the fact that the affected livestock operators are contacted by the company prior to permitting of any seismic lines. Geophysical exploration requires off-the-road travel which crushes plants. The dirt work needed for crossing ravines would remove small amounts of vegetation. Generally, this phase would have only a minimal impact to the vegetal resources in comparison to following phases.

Sheep lambing grounds on Slate Creek Allotment



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Based on an assumption of continued disturbance at current levels, the construction of well pads and roads for oil and gas production during the short-term would destroy approximately 6,565 acres of vegetation as a direct impact. Indirect impacts (e.g., planned permanent road network expansions and transmission lines) could impact another 12,172 acres of vegetation. Not all of these activities would impact the vegetation to that extent, however, as electrical transmission lines destroy only a very small percentage of the vegetation.

Some livestock mortality from H₂S production may occur. This occurrence is rare. A "no surface occupancy" stipulation for a 500-foot buffer zone around live water added at the lease stage would prevent damage to these areas and minimize the loss of forage. These sites are important to livestock as a source of forage and water. This will also help maintain the water quality for livestock.

Intensive field operations, (e.g., drilling during the lambing season), could have a significant impact on lambs. Vehicular traffic moving at fast speeds on the roads may run over lambs. Noise of the equipment also causes the livestock to move away from the area of activity. Unfenced mudpits present a hazard and may cause animal deaths. Damages to fences, gates left open, and damaged cattleguards often result from seismic exploration activities.

There are some benefits to livestock from oil and gas related activity. These benefits are usually in the form of new water resources that were discovered through drilling operations.

Preferred grazing sites would continue to be over-utilized by livestock and there would be a long-term decrease in forage on these sites. This is due to distribution problems rather than to over-stocking. As those preferred sites decline in productivity, livestock would be forced to utilize more marginal areas. This would result in a decrease in calf weights, unless supplemental feeding is started, as livestock are forced to travel longer distances for water and forage. These impacts would occur more frequently on summer cattle ranges, as sheep are herded and are less susceptible to this deterioration of preferred sites. For those allotments with predominately winter sheep use, forage quantity would probably be maintained over the long-term, although some areas may exhibit decreased productivity. Actual adjustments in stocking rates would be based on analysis of existing monitoring studies.

Since so few range improvement projects would be constructed under this alternative (Appendix A-2), most areas that are currently underutilized would remain so and those areas currently subjected to higher than allowable grazing pressure would continue to be heavily utilized. If the existing situation were allowed to continue, a gradual decline in the suitable forage base would result in an eventual decline in livestock grazing capacity. Scheduled vegetation manipulation would increase suitable livestock forage on 5,000 acres.

The "M" and "C" category allotments would have little change in management and are expected to remain at or near current condition. The exception to this would be the sites which are in close proximity to water. These areas are expected to decline in productivity over the long term due to the effects of continuous grazing with no periodic rest or deferment.

The majority of the impacts associated with continuation of management as it now exists would occur in the "I" category allotments. Those allotments currently managed under allotment management plans would become more productive due to coordinated grazing systems and associated vegetation manipulation and water developments (see Appendix A-6 for proposed management and associated range improvements). Improved distribution of livestock will result from the implementation of water developments. Since only 10 miles of fence construction is proposed, construction impacts to vegetation would not be significant. Small amounts of forage would be lost in the short term, but virtually none would be lost over the long term.

Currently, requests for conversions in kind of livestock are analyzed wherever they are proposed by livestock operators. This analysis includes a study of suitability for conversion. Some conversions have resulted in declines in vegetative condition (e.g., in riparian areas). This could be expected to continue.

Currently, no developed recreation sites exist in the KRA. It is suspected that little, if any, adverse impacts to livestock would occur in the foreseeable future as a result of contact with campers at developed campsites. Some adverse impacts to forage and livestock will continue to occur due to the KRA's "open" designations with respect to ORV recreation. Occasional losses of livestock due to hunting is expected.

The disposal of public lands in the Star Valley area would have a detrimental effect on grazing lessees in that area, unless the affected lessee is able to buy the land or the land was transferred

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to another agency which would continue the grazing lease. If all grazing leases were disposed of in Star Valley, this would amount to an approximate reduction of 604 total Federal AUMs, or approximately 0.4 percent of the total AUMs for the KRA. If these lands were to be disposed of through R&PP grants, grazing would be discontinued and the livestock operators would be adversely impacted.

Seasonal stipulations on rights-of-way would protect sheep lambing during the crucial period in the spring. This is important because of abortions of lambs due to disturbance of the ewe. Abandonment of lambs is also a problem. Stipulations on rights-of-way would mitigate impacts to lambing operations.

Impacts to livestock grazing from road closures in the Raymond Mountain area would be minimal but generally beneficial. There may be some slight beneficial impacts to livestock grazing due to fewer people using the area. Road closures would not have an adverse impact on livestock operators because they would continue to have access to the area to do any necessary tasks incidental to their livestock operation. Vegetation would be benefitted by exclusion of roads and the associated adverse impacts.

Some wet meadows, springs, and seep areas could conceivably be impacted from road construction activities. These are important areas for livestock and their disturbance could adversely affect grazing animals.

Short-Term Use Vs. Long-Term Productivity

There would be no significant long term effects from geophysical or seismic exploration. Production facilities and associated roads would result in loss of productivity from these sites. Reclamation may eventually mitigate this impact.

Sites preferred by livestock would decrease in condition and productivity in the long term because of the lack of new grazing systems. This would eventually result in a reduction in grazing capacity except on the five existing AMPs. Continued use of the stock trails would minimize the impacts to the allotments being trailed through.

Unavoidable Adverse Impacts

Some disturbance to vegetation as well as livestock operations would occur as a result of geophysical exploration. A limited amount of forage would be lost as a result of facility construction. A limited amount of harassment

and disturbance to livestock management would occur from ORV use. Approximately 578 AUMs would be lost due to coal development.

Irreversible and Irretrievable Commitment of Resources

The gradual decline in condition on non-AMP allotments would eventually result in the permanent loss of forage. Reclamation efforts to restore surface-disturbed areas would not be complete. Some sites, such as access roads, may remain disturbed. Parcels proposed for a disposal through the Lands program would result in the loss of 646 AUMs.

Conclusion

Under continuation of existing management, range condition on 5 AMP allotments would remain static or improve slightly. Conditions on all other allotments would not be expected to improve. Since no new AMPs would be developed, areas presently receiving higher than allowable use, such as riparian areas, would continue to receive similar use levels. Range improvement money would be directed towards maintenance and reconstruction of existing projects. This alternative would eventually result in a reduction in the amount and availability of preferred forage species.

FISH AND WILDLIFE HABITAT

The impacts of geophysical exploration occur mainly in areas, or during time periods not covered by existing stipulations. Activities are often allowed in important wildlife habitat if weather or other localized conditions have changed animal use patterns. For example, if mild weather conditions occur in early winter, seismic companies are allowed to operate within big game winter ranges. Sudden heavy snowfalls can quickly move herds into crucial winter ranges forcing a conflict between exploration activities and wildlife. However, since the geophysical operations are terminated within the crucial winter ranges shortly after the first heavy winter snowfall, the impact to wildlife is minimal. Current stipulations are generally effective in minimizing exploration activities in crucial wildlife habitat.

Existing oil and gas development affects wildlife by removing habitat and increasing disturbance. Each well site removes

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approximately three to five acres of habitat in addition to increasing human disturbance to wildlife by developing access roads and maintaining roads during all weather conditions. Existing impacts occur mainly where oil and gas development is concentrated along the Bear River Divide and Granger areas, which are generally in summer ranges for mule deer and antelope. However, development appears to be progressing northward along the Overthrust Belt and increased activity is beginning to occur in crucial big game winter ranges, such as the Horsetrap and Bullwinkle Units. In localized areas these impacts may be significant.

Direct toxic effects to aquatic plants could occur as a result of chemical contamination through mud pit washouts or runoff from drill sites. Chemical concentrations as low as 1 part per million of chromate, for example, could be toxic to plants (Bell, 1973). Large and sudden dieoffs of aquatic plants would then create oxygen depletions, especially at night, due to the oxygen demands of the decaying organic matter. This in turn could lead to fish mortality and other impacts down the food chain.

The impacts to wildlife from existing and potential coal development were analyzed in the Coal Amendment to the Pioneer Trails MFP (USDI, 1976a). Important raptor nesting areas, big game winter range, and other wildlife habitat were identified as unsuitable for mining, or mitigation measures were developed to reduce possible impacts to wildlife. Mitigation for wildlife will be included in mine plans for new mines. Similar stipulations and mitigation were included in an MFP amendment on sodium (trona) mining.

Reclamation practices impact wildlife habitat primarily by affecting the rate of plant community succession following disturbance. The use of native vegetation for reclamation, as currently practiced, is generally beneficial to wildlife except when native species are less suitable to disturbed sites, resulting in decreased vegetation cover and increased erosion. Accelerated erosion and siltation of streams and reservoirs has occurred in some areas of the Bear River Divide and can probably be attributed to oil and gas related activities.

Existing grazing management has caused accelerated erosion and a declining trend in riparian condition throughout much of the KRA (Appendix F). Improved livestock distribution and deferred grazing can produce a marked improvement in riparian condition, as documented for the Huff Creek drainage. Under this alternative, a lack of management to improve grazing distribution and minimize livestock/

wildlife conflicts would cause a continued decline in riparian condition throughout the KRA (Figure 4-2). It may also result in a decline in big game numbers due to forage competition in preferred habitat. Decline in riparian condition may reduce populations of the Bonneville cutthroat trout which would increase the likelihood of its being listed as a T&E species.

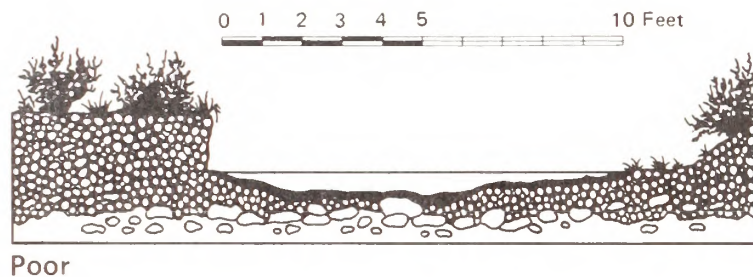
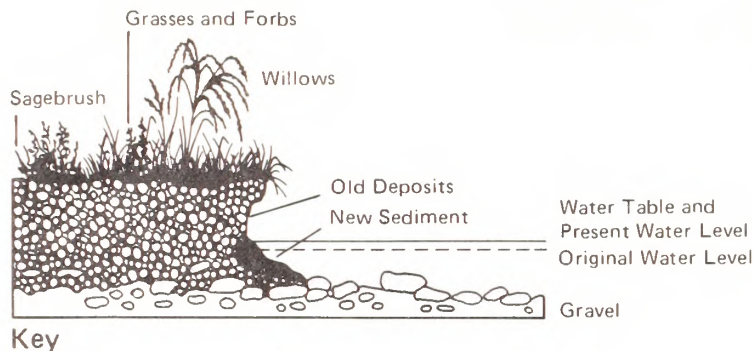
Existing wildlife program objectives are designed to benefit wildlife habitat by implementation of one ACEC and two HMPs. This would impact wildlife habitat in the Raymond Mountain area and, by developing objectives to mitigate wildlife habitat loss, in the Overthrust oil and gas area. In addition, the Woodruff Narrows HMP would improve and maintain habitat for bald eagles.

Unrestricted ORV access has caused an increase in road density throughout the KRA, particularly in popular hunting areas. This has reduced the available security cover for big game resulting in a reduction of available habitat. In addition to increased disturbance levels, unrestricted ORV use has caused accelerated erosion and loss of habitat due to the physical destruction of vegetation and soils.

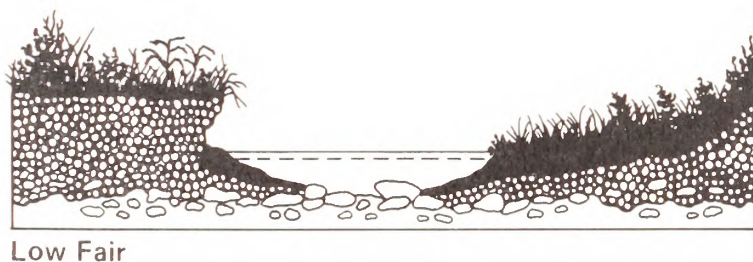
Changes in habitat caused by fire are likely to cause changes in wildlife populations. Many wildlife species are early to mid-successional; fire, which retrogresses most plant communities, improves habitat for these species. Examples of animals which may benefit from fire include mule deer, moose, and elk. An important exception occurs when crucial (limiting) winter range is burned; if important thermal, hiding, or browse cover is reduced, animal populations are correspondingly reduced until cover is restored. There are also some wildlife species that are dependent on climax plant communities. These populations may be temporarily reduced following fire and include sage sparrow and sage grouse. With these species, large fires are more detrimental than small fires. Additional information is available from Fisher and McClelland (1983), Klebenow and Beall (1978), Lyon, et al. (1978), McGee (1976), Ream (1981), Stanton (1975), and Wright and Bailey (1982). The impacts described above would occur only from wildfires, which would be suppressed as described under Existing Management.

Short-Term Use Vs. Long-Term Productivity

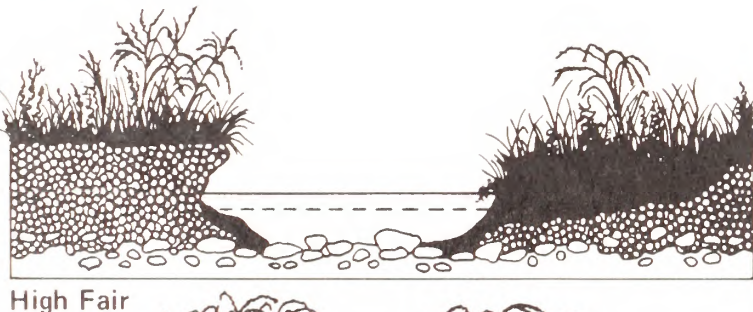
Most surface disturbance activities would affect the long-term productivity of the resource area for wildlife to a minimum degree. The exceptions to this would be in instances where



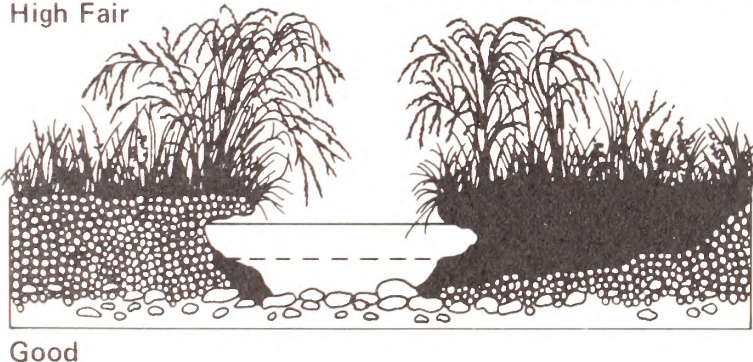
Channel wide, shallow and easily warmed by full exposure to solar radiation. Low bank stability with active bank erosion. Riparian vegetation quite limited, sagebrush to the streambank in many areas. Low riparian water table. Bottom sediment approaches 60%+, smothering gravel deposits. Habitat for aquatic or terrestrial wildlife essentially nil.



Riparian vegetation begins to form on silted bars and banks forming a sediment trap which builds up banks and begins to confine the channel. Water surface still fully exposed to warming, but level begins to rise, forcing out riparian sagebrush and bringing back riparian vegetation. As flow becomes confined, sediment is reduced to 40-60%. Conditions similar to those of moderate grazing pressure. Willow growth depressed. Habitat value to aquatic or terrestrial wildlife is still quite limited.



Semi-confined by development of riparian vegetation with dense root mass. Banks stabilized by vegetation and bottom sediment reduced to approximately 20-30%. Rising water table is reducing sagebrush in favor of riparian grass shrubs. Stream continues deepening as bank resistance to erosion increases. Pools and riffles for fisheries are improving as more gravel is exposed.



Confined-deep channel, elevated riparian water table, fully developed vegetation in riparian zone stabilizing cutbanks, deposited sediment and over hanging banks. Physical cover highly developed for both aquatic and terrestrial organisms. Bottom gravels clean with only 10-15% sedimentation. Reduced water temperatures due to 40-60% shading of surface area.

Adapted from "Guidelines for Management of Trout Habitat in Wisconsin," 1967

Figure 4-2
EFFECTS OF CATTLE GRAZING ON TROUT HABITAT

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there is a significant density in a particular area or where disturbance occurs in crucial winter range. Wyoming Game and Fish objective numbers are expected to be maintained.

Unavoidable Adverse Impacts

Surface disturbing activities would result in the loss of both real and effective habitat loss for wildlife until the disturbed area is reclaimed.

Irreversible and Irretrievable Commitment of Resources

Wildlife habitat would be committed to energy development, roads, and other surface disturbing activities for the life the plan and beyond. Few of these would be irreversible.

Conclusion

Short-term impacts to wildlife would occur from mineral development during the construction phase when human disturbance to wildlife was present. Long-term impacts would occur from producing wells and fields. Grazing impacts would be long-term if management practices caused the elimination of riparian vegetation or resulted in different successional stages in plant communities than would be present without grazing. Short-term grazing impacts result from a decrease in forage availability for wildlife. Wyoming Game and Fish objective numbers are expected to be met.

LAND RESOURCES

Disposal by sale, exchange, transfer, or R&PP of parcels of BLM land that are isolated would have several beneficial impacts. BLM's management costs for these parcels could be redirected to lands where there would be a greater public benefit. Approximately 3,700 acres in Star Valley and 48,000 acres in the remainder of the KRA are being considered for disposal (Appendix D, Map 7). Sales could enhance the management of some private land by eliminating Federal inholdings. Many of the small isolated parcels have no legal access so a sale would generally be to the adjacent landowners. The public would not have to support the management of lands to which they have no access.

If land sales were held competitively, pricing may be out of range of adjoining landowners' financial capability. Such competitive sales might have an adverse impact on ranchers and other adjacent landowners if they did not purchase the land. The subsequent use of the land may change and could conflict with the use of the adjacent landowner.

Sales near communities could increase development possibilities and provide land for public services and/or private use.

Disposal of public surface could impact the oil and gas industry by creating split estate. While this would not affect the availability of oil and gas resources, it would require that the industry representative deal with the surface owner as well as with BLM.

Disposal of the surface could reduce the availability of locatable minerals, especially in areas where there are commercial quantities of sand and gravel or where there is a high probability that locatable minerals are present. When a parcel with these values is identified, it would be removed from disposal consideration. When a parcel possessing high mineral potential is disposed of, the minerals would be reserved to the United States and would be legally available for development. Mineral development would require negotiations with the new surface owner.

The use of the land after a sale may result in adverse impacts to soil, water, and air resources. However, local zoning and county, State, and Federal regulations should minimize this impact. Disposal of land in wildlife habitat could adversely impact wildlife if the subsequent use destroyed habitat or affected wildlife during critical breeding, calving, and nesting areas.

Lands that are transferred to another agency for management are not expected to add a significant amount to their administrative costs. The public would benefit from improved management and would retain the benefit of the land remaining in Federal ownership.

R&PP lands generally provide land that is needed by the local community for public services development. The benefit/cost ratio of these actions can be very favorable and, in many instances, are the only economically feasible way to proceed with a public project. Grazing and mineral interests may be adversely impacted because they are generally incompatible with R&PP projects.

Seasonal stipulations that are imposed on rights-of-way can cause delays and additional

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expense for the right-of-way holder. Waivers of these stipulations, when conditions allow, mitigate the impacts to the holder. Requirements to keep roads ¼-mile from streams wherever possible and to design bridges and culverts to allow fish passage result in increased costs for right-of-way holders.

Special stipulations that are applied on a case-by-case basis to protect specific resources can be costly and/or cause time delays for the company. In some instances, the initial cost is offset by decreased rehabilitation cost.

There are no year-round avoidance areas which could cause degradation of some sensitive habitat. Larger rights-of-way are confined to an existing corridor, where feasible, to minimize the area that is impacted.

Granting separate rights-of-way for each communication site on a hill creates management difficulties for the BLM and confusion among users.

The lack of a comprehensive access acquisition plan would result in delays for the program that needs access. Trying to obtain access on short notice would create confusion and hard feelings among landowners.

Short-Term Use Vs. Long-Term Productivity

Land tenure adjustment would create loss of public grazing privileges, loss of crucial wildlife habitat, and depending on post transfer use, loss of soil and vegetation.

Construction or other surface disturbance that takes place on rights-of-way would increase soil erosion and decrease vegetation establishment, thereby reducing long-term productivity.

Unavoidable Adverse Impacts

Lands would be lost to the public for multiple-use purposes. Soil, vegetation, and livestock grazing losses would occur due to reduced reclamation requirements. Some ultimate uses may also adversely impact visual resources.

Irreversible and Irretrievable Commitment of Resources

A change in ownership of public land would be an irreversible and irretrievable commitment of the land resource if sold to private interests. Lands involved in disposal would not constitute a significant portion of the resource area.

Conclusion

Land tenure adjustment is expected to result in overall beneficial impacts and improved management. Seasonal and other stipulations for rights-of-way result in costs to the right-of-way holder. These costs are expected to remain approximately the same percentage of total project costs as they are now. The case-by-case processing of access needs may result in efficiency below that of a comprehensive access acquisition program.

CULTURAL RESOURCES

In general, the cultural resource compliance program is sufficient to adequately identify and mitigate effects of significant cultural resources that could be adversely impacted by Bureau initiated, sponsored, permitted, or licensed actions. However, instead of being reactive, the cultural resource program has taken a number of active steps to manage cultural resources on public land in the KRA. These include development of a Historic Trails Plan and Cultural Resource Management Plans.

Under Existing Management, geophysical explorations may damage fragile and irreplaceable cultural values such as stone circle/tipi ring sites, and historic trails. This is especially true if these are conducted off established roads; under muddy conditions; or involve blading or other surface disturbance. Culturally sensitive areas such as those near perennial streams, dependable water sources, and semi-stabilized sand dunes can also be adversely affected by geophysical operations.

The “no surface occupancy” stipulation on oil and gas activities concerning the distance from historic trails and live water would have a beneficial effect to cultural values. Native populations extensively utilized areas near perennial water sources or dependable seasonal sources for their subsistence activities. Stream terraces and certain upland situations near live water were favorite locations for subsistence and settlement activities of these populations for the last 11,000 years. By restricting activities in these areas, cultural values can be protected.

Reclamation procedures under Existing Management (e.g., reseeding, recontouring, ditching, and placement of culverts) can have adverse impact to cultural values unless the values have been previously identified. The mitigation measures surrounding reclamation

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activities need to be refined and compliance monitored closely.

Livestock grazing could have both beneficial and adverse impacts to cultural values. Increased grazing and prescribed burns allow better surface visibility, thus making cultural resources easier to locate. However, livestock grazing in muddy areas can have an adverse impact to fragile surface and subsurface cultural resources by disturbing existing cultural deposits or by increasing rates of erosion.

Restricting activities in riparian habitats have a beneficial impact to cultural values. Native populations utilized these habitats for hunting and gathering activities and were a pivotal ecosystem in their subsistence and settlement pattern. Therefore, restricting activities in these areas would help to keep intact any cultural remains that may be present.

ORV use in the KRA can have the same adverse impact as geophysical activities. Fragile cultural values in sand dunes, for example, can be destroyed by extended ORV use. These vehicles can potentially increase the local erosional cycle and can disturb in situ cultural sites. Once these sites are disturbed, they cannot be replaced nor can they be put back where they were located.

Under Existing Management, the entire resource area is open to new road construction except the Raymond Mountain WSA. These new roads, again, could adversely impact fragile cultural values for the reasons outlined above.

Short-Term Use Vs. Long-Term Productivity

Short-term land uses are generally compatible with the long-term "productivity" of the cultural resource data base. The lack of Class III inventory requirements for seismic activity may result in non-mitigated impacts to both prehistoric and historic cultural properties. Additional unmitigated impacts may occur where Class III inventories are not performed before development.

The short-term use of the Historic Trails network called for in the Historic Trails Management Plan (i.e., increased visitor use and appreciation) may conflict with the long-term productivity of the trail network as a cultural (and recreational) resource. Pristine trail ruts will be impacted by modern ORV passage. Areas that were unspoiled by modern intrusions may become littered and tracked up with the integrity of setting compromised. Introducing modern improvements such as comfort stations, picnic

areas, and developed interpretive sites has both positive and negative impacts that may affect the long-term productivity of the trails as a cultural resource.

Unavoidable Adverse Impacts

Because of funding, workforce, and time constraints, unavoidable adverse impacts occur to the cultural resource base.

Surface-disturbing activities, including energy development, may result in unavoidable adverse effects to the cultural base. Projects vary in scale. Range improvement projects, R&PP actions, and an open ORV designation for the resource area are program elements that may result in unavoidable adverse impacts to cultural resources.

Irreversible and Irretrievable Commitment of Resources

Few non-mitigated irreversible or irretrievable commitments occur to known cultural resources as a result of current land uses.

Conclusion

The lack of restrictions on other resource programs in riparian and other areas could result in irretrievable losses to cultural resources in these areas. Even the 500-foot "no surface occupancy" stipulation would not protect all cultural resources near live streams. Irretrievable losses may still occur. The extent of these would depend on the area, especially the topography.

FORESTRY RESOURCES

The construction and oil and gas facilities in forested areas may increase. The impacts to forest management from these activities can be both adverse and beneficial. The establishment of access roads to oil and gas development could benefit timber management by providing better access to timber stands. However, roads and well development in these areas takes land out of production for growing trees. If the species used for reclamation do not preclude the re-establishment of commercial timber stands, the long-term impact on forestry resources would be minimized. If livestock and wildlife are allowed to freely use these areas during reclamation, re-establishment of commercial timber stands would take longer.

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The reclamation requirements for abandoned roads would result in increased costs for logging operations.

If timbered lands in Star Valley are disposed of, the timber base of the KRA would be reduced slightly. This would not be likely to affect regional timber production.

Another important impact is the additional costs to logging operations because of the requirement for crossing perennial drainages only at constructed crossings. These additional costs would be considered when the price of a timber sale is determined. When there are additional requirements imposed on a logging operation, the price of the timber sale is reduced. As a result, the revenue to the government from that timber sale is also reduced.

RECREATION

The exclusion of geophysical activity from hunting areas (Map 4) will prevent adverse impacts to hunters. Since the status of wildlife in the vicinity of geophysical lines would be checked (in crucial big game winter range) on a case-by-case basis, wildlife would not be significantly impacted by geophysical activity. Consequently, recreation associated with hunting would also not be significantly impacted.

Oil and gas drilling and rights-of-way would also be restricted in crucial big game winter range to minimize impacts to wildlife. This would also help limit impacts to hunting.

ORV use would be open and unrestricted except for closures in the Raymond Mountain area. This would increase the ability to provide ORV opportunities. Use is expected to continue at current rates and impacts from ORV use (e.g., decreased vegetative cover, increased erosion) would continue to occur. There may be some conflicts between ORV users and livestock operators.

The ACEC in the Raymond Mountain WSA would continue to be managed to protect the Bonneville cutthroat trout and its habitat, and big game crucial winter range even if Congress decides against designation as a wilderness area. New oil and gas leases will not be issued renewed until the Secretarial decision and appropriation act language banning leasing has been revoked.

Short-Term Use Vs. Long-Term Productivity

Oil and gas development and use of access roads for oil and gas development would

continue and, in areas of high recreation potential, would result in adverse impacts to recreation resources for periods of time extending well beyond the life of individual developments.

If oil and gas development does increase significantly, surface disturbance in crucial big game winter range may also significantly impact hunting in the KRA. At this time, oil and gas development is not expected to increase to this degree.

Unavoidable Adverse Impacts

Oil and gas exploration and development would continue to result in adverse impacts to recreation resources. Noise, surface disturbance, and more people are all factors which adversely affect enjoyment of the resource.

ORV activities would continue to result in uncontrolled adverse impacts to vegetation and soils.

Irreversible and Irretrievable Commitment of Resources

If development occurs in or near areas of high recreation potential, these areas may be destroyed or diminished.

Conclusion Some areas of high recreation potential may be significantly adversely impacted by oil and gas development. Locations and degree of these potential impacts cannot be predicted until APDs are submitted. The APD review and approval process would help mitigate impacts to recreation as well as other resources.

Significant recreation resources would be protected from significant adverse impacts. These resources include the Oregon and Mormon Trails, Alfred Corum and Nancy Hill graves, Emigrant Springs, and the Raymond Mountain ACEC.

FIRE MANAGEMENT

Full suppression of wildfires is the only option available under Existing Management. With the exception of the Raymond Mountain WSA, there are no impacts to fire management from the other programs. Within the Raymond Mountain WSA, current policy requires full suppression of all wildfires but because of the WSA status, motorized access is allowed only from the air

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or an existing access roads. No off-road travel is permitted. Since only up to 5,000 acres of prescribed burning are planned (to implement existing AMPs) the effects of this alternative of fire management would be minimal.

Conclusion

Current policy dictates that wildfires will be fully suppressed. Fewer total acres would be burned and long-term productivity would be less than under the other alternatives. Wildfire would not be utilized as a management tool under this alternative.

SOCIOECONOMICS

Livestock - As indicated by Appendix I-1, continuation of existing management practices is not expected to result in major impacts to the livestock sector of the KRA. Over a total 30-year adjustment period, there would be about 1,270 more available Federal livestock AUMs, raising the AUM level from a current 162,000 to 163,000. This is less than a 1 percent change. Such a small increase would have virtually no effect on average annual ranch income, employment, or livestock sales (Appendix I-2). Total business activity attributed to the livestock sector would increase an average of less than \$1,500 during each of the first 30 years of the analysis period.

If the Federal AUM level remains at 163,000 for the last 20 years of the 50-year analysis period and State and private AUMs remain the same on "I" allotments, combined receipts from livestock sales would be about \$21,550 per year higher during that 20-year period. This also assumes that operators would have increased herd size and livestock sales to take advantage of the greater number of available AUMs. This amount of increase is relatively insignificant compared to the combined 1981 receipts from livestock sales of approximately \$24 million shown in Table 3-20.

Recreation/Wildlife - No changes are projected for the Recreation/Wildlife sector under this Alternative.

Net Regional - Since there are no changes anticipated for the Recreation/Wildlife sector, the impacts from the Livestock sector are the only ones reflected in net regional income and business activities. These changes were stated above under Livestock.

Employment - Under this Alternative, there would be virtually no change in ranch or regional employment and, subsequently, no related social

impacts to the region. Table 3-23 indicates wage and salary agricultural sector employees totaled 394 and non-farm employees about 36,674 in 1981.

Livestock Benefit/Cost Analysis - Appendix I-3 lists net present value at less than \$2,000 and a benefit/cost ration of just over 1 for the livestock management proposals in this Alternative. This means that for every \$1.00 of costs expended in the program, about \$1.00 in benefits would be realized.

ALTERNATIVE A

AIR QUALITY

Under Alternative A, air resource management in the KRA would be the same as under Existing Management. The types of impacts are expected to be similar to those expected under Existing Management. Map A shows pollution potential in the KRA.

This alternative is not expected to increase oil and gas production (as compared to Existing Management) in the KRA. However, if there were a change in the conditions affecting oil and gas activity because of reduced restrictions on oil and gas development, it is the alternative most likely to result in such an increase. In the event of oil and gas production does increase during a particular time period, increased emissions into the atmosphere in the region might be expected from new or upgraded sweetening plants necessary to process any increased sour natural gas production which might occur. In addition to these increased direct emissions, there would be a corresponding increase in emissions from increases in population. Population, or secondary growth, sources of pollution are not regulated by State of Wyoming regulations and would most probably not be significant on a regional scale. In some localities however, large increases in population could add to the severity of wintertime inversion events.

In the event of an oil and gas production increase, the chances of accidental release of H₂S would be increased. Well field contingency strategies would remain the same as under Existing Management as would policies controlling the distribution of H₂S rich gas. These would be applied to the increased number of wells under this alternative. As populations in the area increase, however, the chances of members of the public wandering into unsafe areas during an

ENVIRONMENTAL CONSEQUENCES

accidental release of sour gas would also increase.

Short-Term Use Vs. Long-Term Productivity

Same as Existing Management.

However, if oil and gas production does increase under this alternative, short term additions of nitrogen oxides and other pollutants would occur from increased numbers of drill pads. Increased emissions might also occur from construction of pipelines, compressor stations, and other facilities. These emissions would result in short term increases in ambient concentrations which would drop to preconstruction levels after building ceases. Some facilities, such as compressor stations, would emit relatively minor amounts of pollution for their useful life or the life of the well field. These emissions would be negligible on regional scales, but could result in short term impacts to visibility or other air resource values in localized areas.

Unavoidable Adverse Impacts

Same as Existing Management.

However, if oil and gas production rates do increase, quantities of air pollutants would also increase as would risks to public health and safety. The number of facilities proposed to process increased quantities of sour gas would increase, requiring more sour gas and sweet gas pipelines. Particulates from additional traffic and population would also increase.

Irreversible and Irretrievable Commitment of Resources

Same as Existing Management.

However, if oil and gas production does increase, increased emissions from major sources of air pollution, most notably natural gas sweetening plants, could occur under this alternative. These emissions may increase the amount of acidifying compounds which are deposited in sensitive watersheds such as those identified in the Jim Bridger Wilderness Area. Although it is not scientifically feasible to determine the extent or location of these purely potential impacts, it is possible to state that loss of resources (i.e., fisheries, forests) appears to have occurred in other parts of the world due to acidification. Existing management practices would limit these impacts to the point of being negligible, but, some loss of resources in highly

sensitive areas might occur if careful planning of development was abandoned.

Conclusion

Same as Existing Management.

GEOLOGY AND MINERALS

Seasonal restrictions on geophysical lines would be greatly reduced, resulting in fewer time delays and lower costs. Most impacts to oil and gas development caused by seasonal stipulations on leases would gradually cease, since the stipulations would not be added or would be deleted when new leases are issued. Fewer delays would result in fewer scheduling problems for drilling rigs and other equipment and lower costs. More acreage would be available for surface occupancy than under Existing Management, as "no surface occupancy" stipulations would be removed from new leases as they are issued. This could result in decreased drilling costs since directional drilling would not be required. In the Raymond Mountain WSA, leases for oil and gas would again be issued, if Congress upholds BLM's recommendation for non-wilderness status. Development would proceed in the area with only standard stipulations.

Costs associated with H₂S safety plans would be the same as under Existing Management.

Reclamation of well sites would be less expensive than under Existing Management, since no fencing or fertilizing would be required and the seed mixture would only require one grass species.

Impacts from restrictions on mining riparian areas would be the same as Existing Management.

Short-Term Use Vs. Long-Term Productivity

Short-term use of mineral resources, especially oil and gas, would increase compared to long-term productivity of other resources due to the lack of stipulations compared to other alternatives. Long-term productivity of oil and gas may be increased due to increased drilling in areas that might otherwise be closed off, however, this would depend on the location and frequency of oil and gas discoveries. Presently, we cannot predict where such discoveries will occur.

ENVIRONMENTAL CONSEQUENCES

Unavoidable Adverse Impacts

No unavoidable adverse impacts to geology or minerals have been identified.

Irreversible and Irretrievable Commitment of Resources

The irreversible and irretrievable commitment of resources would be the same as under Existing Management except that the amounts of minerals and fuels consumed would probably be highest under this alternative.

Conclusion

Drilling for oil and gas may be increased slightly over the short term (compared to Existing Management) as operators move into the KRA before other areas because of the relaxed requirements. Costs to operators would be reduced while they continue to operate under reduced restrictions.

SOILS

The impacts would continue as described in Existing Management or would increase as development becomes more widespread. Lack of seasonal stipulations for wet conditions and no restrictions on surface occupancy near live water will both contribute to increasing erosion and loss of streambank stability. Direct sedimentation and soil loss will result from relaxing stream crossing stipulations (i.e., decrease in use of culvert, bridges, etc.). Impacts associated with right-of-way permits and mining remain the same as under Existing Management.

Reclamation would follow current practices and involve similar impacts. Under this alternative, however, seeding with a soil stabilizing species as the sole seed mixture promotes stability as the primary reclamation goal. Cover crops would be established expeditiously and erosion due to construction would be held at a minimum. Total lack of fertilization and fencing under this alternative would limit overall success of revegetation efforts.

Opening of oil and gas leasing in the WSA (if Congress decides that it is unsuitable for wilderness) would drop the "no surface occupancy" protection for the Raymond Mountain watersheds. This area may experience impacts of accelerated soil erosion from soil compaction, exposure and loss of vegetation due

to development and ORV use in fragile areas.

An increase in AMP development and interagency cooperative management plans over current management would have long-term beneficial impacts on soils and watersheds within 18 allotments. AMP's which utilize grazing systems can expect increases in plant vigor, ground cover and decreases in erosion susceptibility. The 82,610 acres of vegetation manipulation which would be conducted would result in impacts similar to those described under Existing Management. Implementation of grazing systems which utilize riparian forage during dry periods would promote long-term stabilization of the riparian zone.

Vegetation manipulation through prescribed burning would cause localized short-term impacts to physical and chemical characteristics of soils, increasing erosion susceptibility through the loss of both ground cover and litter accumulation. In the long term, vegetation would increase over preburn production levels which would minimize the erosion hazard. These impacts may be greater than under Existing Management because of the likelihood of a greater acreage being subjected to prescribed burns.

The lack of restrictions for logging and road construction and ephemeral stream crossings would increase soil loss on timber harvesting areas.

Short-Term Use Vs. Long-Term Productivity

Short-term use involved with geophysical exploration, oil and gas development, and mining would result in impact to long-term soil productivity similar to those of Existing Management. The lack of fertilization and fencing would diminish long-term productivity through compaction and low nutrient availability. Any implementation of AMPs would increase long-term soil productivity through distribution of compaction potential and protection of ground cover. Short-term soil loss due to vegetation manipulation (82,610 acres) and construction of range improvements (on 39 allotments) would result in long-term increases in soil productivity as in Existing Management. Relaxing stipulations on equipment crossings (riparian areas) may increase breakdown of streambanks and rutting, thus decreasing long-term soil productivity in areas of disturbance. Opening of the WSA to oil and gas leasing (if Congress finds it unsuitable for wilderness) would result in a reduction in long-term soil productivity in the Raymond Mountain area.

ENVIRONMENTAL CONSEQUENCES

Unavoidable Adverse Impacts

Unavoidable soil loss associated with disturbance contribute to both a loss in soil productivity (loss of fertile topsoil or rooting medium) and initiation of soil erosion leading to downstream sedimentation.

Irreversible and Irretrievable Commitment of Resources

Irretrievable soil loss will continue as in Existing Management but, however, is likely to increase as new leases are issued renewed with fewer restrictions. The potential losses may be mitigated through use of soil stabilizing species in reclamation. Irreversible loss of soil productivity can be expected in landslide activity and in disturbance where inherent fertility is diminished (i.e., mixing of topsoil with subsoil). Soil losses may be compounded if the production of oil and gas increases. As explained under Air Quality (of this alternative), an increase in production is not expected to occur solely because this alternative is implemented.

Conclusion

Short- and long-term cumulative impacts resulting from oil and gas exploration, development and associated activities would be of longer duration and greater magnitude than under Existing Management. This is due to a relaxation of stipulations, restrictions, conditions, and reclamation requirements for surface-disturbing activities. Implementation of AMPs will provide a higher level of management and long-term increases in watershed stability. These beneficial impacts are likely to be more than offset by these soil resources lost due to oil and gas development. The irretrievable commitments of the soil resource would be substantially more than under Existing Management.

WATER RESOURCES

Geophysical and oil and gas operations would continue to adversely impact water resources. By eliminating seasonal stipulations, especially during the late spring and early summer, these programs would further enhance erosional rates due to the wet muddy conditions. Riparian areas would be severely impacted, sedimentation rates

would increase, and water quality would continue to degrade. Salinity and sediment yield would be most adversely affected. The impacts resulting from reclamation are not expected to change from Existing Management since fertilization or fencing are not required. Vegetation establishment and sedimentation rates would remain the same. However, sedimentation rates resulting from grazing would decrease over the long-term due to the implementation of AMPs on 18 "I" allotments. In addition, vegetation manipulation would increase sediment yield in the short-term but this increase would subside in the long-term when new vegetation is established. Sediment yields from areas where vegetation is reestablished would be near or below present levels.

There would be minor short-term increases in sediment yield in riparian areas. In the long term, sediment levels would decrease and water quality would improve. Impacts from ORVs, wilderness designation, land tenure, rights-of-way, and access would not vary from Existing Management.

Short-Term Use Vs. Long-Term Productivity

As a result of unrestricted oil and gas exploration, short-term impacts to water quality would be from accelerated erosion from an extensive road system, well pads, and ORVs. These impacts to the riparian and wetlands zones could result in a long-term water quality problem in that the stream channel may regrade itself and result in a sustained high sediment load until a dynamic equilibrium is reached.

Long-term impacts may be realized in groundwater, however, they may not be discovered until the next century.

Unavoidable Adverse Impacts

Damage to the riparian areas would not only impact the channel dynamics of streams, but would provide for sedimentation from the resulting unstable streambanks as well as the uncontrolled road system. Riparian vegetation may decline and stream temperatures would rise slightly.

Unseen and undetectable damage may occur to the groundwater as a result of drilling and waste water injection. This may be considered as incidental, depending on which groundwater aquifers are impacted. Aquifers containing water that is used for human consumption would have the greatest impact.

ENVIRONMENTAL CONSEQUENCES

Irreversible and Irretrievable Commitment of Resources

Permanent damage and change to stream channels would be realized. Since exploration and grazing would not be restricted in riparian areas, damage would cause the regrading of the stream channel which could affect a sizeable reach of stream channel.

Erosion from the extensive road network, if put in improperly, would continue to impact water quality.

Groundwater can be impacted permanently through exploration and waste water injection.

Conclusion

The relaxed requirements for oil and gas development would adversely impact water quality and channel stability. Some riparian areas would be difficult, if not impossible, to reclaim.

Since very few restrictions apply to groundwater, the future of subsurface water may be uncertain.

LIVESTOCK MANAGEMENT AND VEGETATION

There are currently 161,999 AUMs authorized for livestock. An additional 31,901 AUMs of total vegetation are expected to become available. This projection of additional vegetation is dependent upon implementation of 18 new AMPs with accompanying grazing systems and range improvements as well as continuation of 5 existing AMPs.

Monitoring would determine the actual amount of available forage. Allotment specific objectives would determine the proportion of the increase that would be allocated to livestock, to wildlife, and to watershed.

Intensive grazing management would be implemented to satisfy the growth requirements of the more desirable forage species. Flexibility would be built into grazing systems to allow them to be adaptable to abnormal climatic years or economic conditions. Both these factors would serve to increase long-term productivity of the resource area in terms of livestock forage.

Individual grazing treatments are intended to increase the kinds and amounts of desirable forage species. Forage would be utilized more efficiently by livestock and breeding efficiency would be increased.

The implementation of water developments for livestock would promote improved distribution of livestock on the range by providing water in those areas that currently receive limited grazing use. After the development of new waters, new grazing areas would become available and those areas of past heavy use would have a lower level of grazing pressure exerted on them. Areas adjacent to water developments would still be heavily grazed by livestock. Vegetation would be subjected to trampling and soil compaction on these sites would increase. This area is limited in size and mitigation of this impact would be achieved in 23 allotments by scheduled rest, or deferrment grazing treatments.

Manipulation of vegetation would increase livestock forage quantity and quality. There would be 82,610 acres subject to vegetation manipulation. On these acres there would be a short-term reduction in vegetation and a long-term increase in vegetation. Areas with vegetation treatments would generally be rested from livestock grazing for two growing seasons after treatment.

The most favorable sites for vegetation manipulation would be those that contain a sufficient understory of desirable grasses and forbs, so that no seeding of additional plant species would be necessary. Release type vegetation treatments, where re-seeding would not be necessary because of sufficient understory of desirable grasses and forbs, would be preferred.

Minimal adverse impacts would occur to vegetation and livestock from fence construction. Approximately 93 miles of fences are proposed. Some damage to vegetation from livestock trailing along fencelines is likely to occur, but will be negligible and is not expected to affect forage for either livestock or wildlife to a measurable degree. Short-term, limited impacts from fence construction would be those associated with disturbance of the surface.

Restrictions on geophysical exploration would be minimized. This could result in adverse impacts to grazing livestock, as well as to sheep lambing in the spring. Increased disturbance of livestock and abandonment of lambs would occur. Impacts to vegetation would be similar to those discussed under Existing Management but somewhat more adverse. Losses in forage due to oil and gas activity, in general, are expected to be about the same as under Existing Management.

"No surface occupancy" stipulations preventing oil and gas drilling within 500 feet of live water would be dropped. This would result

ENVIRONMENTAL CONSEQUENCES

in local adverse impacts to livestock as activity could prevent livestock from using these important areas for forage and water.

The impacts due to H_2S are similar to those described under Existing Management.

Site reclamation would not be as beneficial under this alternative as under Existing Management. Reseeding with one species of non-native soil stabilizing grass species would decrease forage variability and palatability for livestock grazing. Native species would be excluded from the site for a long period of time and may never reoccupy the site completely. Vegetation condition would not be likely to improve on reclaimed areas. Forage production for livestock would be reduced in many of these areas.

The impacts from the fire management program on plant communities would primarily be beneficial. The post-burn condition of plant communities influences soil erosion, wildlife populations, livestock grazing capacity, silvicultural practices and opportunities, and other resources, and is, therefore, of primary importance on rangelands. Effects of fire on several dominant plant communities on the east and west sides of the KRA are discussed in Appendix E-2.

Short-Term Use Vs. Long-Term Productivity

There would be limited adverse impacts during installation of range improvements. Long term productivity would be increased approximately 31,901 AUMs through range improvements, vegetative treatments, and grazing systems.

The weed and pest control program would retard further spread of noxious weeds. Continued use of the sheep trails would reduce the impacts to the allotments being trailed through. The predator control program would enhance the long term earning potential of the livestock industry in general and the sheep industry in particular. The removal of the remaining 62 wild horses in the KRA would have a long-term beneficial impact on vegetation.

Long term adverse impacts from oil and gas drilling, road construction, etc. would be greater than Existing Management under this alternative. The net effect would be greater adverse impact to livestock grazing and vegetation management. Reclamation of surface disturbance would not be as beneficial to livestock as under Existing Management.



Well construction activities showing accompanying loss of vegetation

Unavoidable Adverse Impacts

Considerable disturbance to vegetation as well as livestock operations would occur as a result of increased minerals development. Harassment of livestock and disturbance to range improvements would continue from ORV use.

Irreversible and Irretrievable Commitment of Resources

The reduction in restrictions on oil and gas development would result in a loss of AUMs compared to Existing Management. Parcels proposed for disposal through the Lands program would result in the loss of 646 AUMs.

Conclusion

Under this alternative, an increase of approximately 31,901 AUMs would be realized from the actions proposed under Livestock

ENVIRONMENTAL CONSEQUENCES

Management. Range condition on five existing and 18 new AMP allotments would remain static or improve. Forage production on riparian areas would increase on these allotments. Range condition on "M" and "C" category allotments would not be allowed to deteriorate.

FISH AND WILDLIFE HABITAT

Only those activities considered a significant impact to threatened or endangered Species would be restricted. Unrestricted disturbance from geophysical exploration would impact approximately the following number of acres of crucial big game winter range in the KRA: 186,834 for elk; 64,512 for moose; 508,724 for mule deer; and 344,511 for antelope. This disturbance could eventually reduce population levels of moose, elk, and mule deer that occupy winter ranges in the Overthrust Area, assuming the current intensive exploration activities continue in this region. Reductions in the populations of big game animals may reduce the populations below Wyoming Game and Fish objective levels at current levels of development. If the level of development does increase, the probability of big game numbers falling below objective levels would increase to a degree commensurate with the increase in the level of development.

In addition, disturbance could adversely impact 55 known sage grouse strutting grounds, possibly reducing population levels in some areas. Raptor nesting sites, except those for bald and golden eagles, would be unprotected, resulting in potential reduced nest success and reduced localized productivity. Damage would occur to riparian areas from unrestricted crossings and bank erosion, especially in the Thomas Fork, Smith's Fork, and Bear River drainages in the northwest part of the KRA, where intensive exploration occurs in habitat supporting populations of Bonneville cutthroat trout.

The impacts from unrestricted oil and gas development would occur to the same important wildlife habitat outlined above. The impacts to big game would be most severe during construction of facilities in occupied winter ranges. In most cases animals would be displaced from preferred habitat causing an increase in winter mortality. Sage grouse would be adversely impacted whenever development occurred within strutting areas causing abandonment of the site and at least a temporary loss in productivity. Disturbance to raptor nesting areas, especially cliffs, would cause abandonment of the site and a loss of

productivity. This could eliminate regional populations of prairie falcons and reduce golden eagles and other species which are dependent on cliffs for nesting. Riparian vegetation would be lost and erosion would increase if drill pads were located within riparian areas.

The impacts from livestock grazing would be less than under Existing Management and would benefit wildlife habitat in several ways. The construction of 82 reservoirs would improve waterfowl habitat and possibly extend the distribution of sage grouse and big game. Water developments and brush treatment would not occur in winter ranges unless wildlife objectives would be met, so adverse impacts to wildlife would be negligible. Fencing 93 miles of rangeland would be likely to cause some mortality of big game and may restrict migration in some cases; however, these losses could be offset by improved livestock distribution and mitigation in the form of fence modifications to allow wildlife passage. Riparian areas would improve in those allotments where livestock distribution was improved. Those allotments high in priority with riparian/livestock conflicts, such as Smith's Fork, Cumberland, and Slate Creek should be the first to show an upward trend in riparian condition and improved fisheries habitat.

Adverse impacts to sage grouse and big game from prescribed burning would be minimized because such activities would not be proposed in habitats important to these species unless specific allotment objectives are to be achieved.

Completing the Cumberland Wetlands and Kemmerer Riparian HMPs would improve waterfowl nesting distribution, diversity, and productivity and improve fisheries habitat and riparian condition.

The sale of lands to facilitate energy development would adversely impact wildlife habitat by eliminating the requirement to mitigate habitat loss for wildlife.

Rights-of-way stipulations would be reduced causing increased adverse impacts to wildlife. If numerous rights-of-way are granted in an area, the increased density of disturbance may adversely affect large areas of effective wildlife habitat. If this occurs in crucial wildlife habitat, the impacts to big game would be significant. This situation could exist even with the current level of oil and gas development.

Short-Term Use Vs. Long-Term Productivity

Under current levels of oil and gas exploration and development, the reduction in long-term

ENVIRONMENTAL CONSEQUENCES

productivity would be greatest under this alternative. The provision that allows crossing of live streams by the most economical method may reduce long-term productivity of the fisheries resource.

Unavoidable Adverse Impacts

Wildlife habitat (e.g., that for big game identified earlier in this section) would be lost for longer periods of time than under Existing Management. In some cases, the habitat would be lost to wildlife well beyond the life of the plan.

Irreversible and Irretrievable Commitment of Resources

Wildlife resources are not expected to be irreversibly committed as a result of implementing this alternative.

Conclusion

Wildlife habitat of the KRA would be adversely impacted to produce oil and gas. The greatest degree of impacts would occur in the short term but many impacts would continue well beyond the life of the plan. Wildlife habitat would be reduced especially from the secondary effects of roads and other developments. Fisheries would also be adversely impacted from sediment load and salinity. These impacts would be the most adverse under this alternative. This alternative would result in the greatest adverse impact to wildlife of any alternative. Few provisions under this alternative would be available if wildlife losses became too great. The plan would have to be amended to provide needed protection for wildlife.

LAND RESOURCES

Land disposal impacts would be similar to those described for Existing Management except where the split estate would create problems for the oil and gas lessee. Depending on the number of parcels that oil and gas lessees identify, the amount of land disposed of will decrease. This would result in a lower amount of taxes received by the county than under Existing Management.

Additional costs and time delays resulting from seasonal and special stipulations on rights-of-way would be minimized. Once construction activity begins, it is not always feasible to stop when weather conditions change. Activity in these sensitive areas, near the time of use by

wildlife or livestock, may result in significant adverse impacts to the habitat condition.

Granting one right-of-way with subgranting rights for communications would simplify BLM's dealings with the users. A condition would require users to form a board to solve any conflicts. This would reduce confusion among user's regarding who to contact about interference or similar problems.

An organized access acquisition program would benefit all program activities and improve relationships with private landowners.

Short-Term Use Vs. Long-Term Productivity

Land tenure adjustments would create the same effects as in Existing Management.

Revegetation measures would emphasize economical measures and thereby reduce the restoration of public lands with the short-term timeframe thereby reducing long-term productivity of the vegetation resource.

Unavoidable Adverse Impacts

Same as Existing Management.

Irreversible and Irretrievable Commitment of Resources

Any parcels sold would be irreversibly removed from multiple-use management.

Conclusion

This alternative provides lands for disposal to facilitate energy development and minimizes restrictions in the lands program. These actions would adversely affect the long-term productivity of other resource values in the KRA.

CULTURAL RESOURCES

Increased seismic activity with fewer protective stipulations would increase the risk of destruction or damage to prehistoric sites and historic sites and trails. Historic trails would be impacted to a greater degree, because seismic work during wet conditions could adversely affect intact trail segments. These impacts may occur because of contacts with the trails by seismic crews or by disturbance to the feeling of solitude and historical association on trail segments when seismic crews are operating. Disturbance to prehistoric sites could also occur

ENVIRONMENTAL CONSEQUENCES

due to relaxation of protective stipulations, illegal artifact collecting, seismic vehicle use during wet or muddy conditions, and increased rates of erosion.

Oil and gas development would have the least degree of restrictions and, therefore, the greatest probability of adversely affecting the viewshed of historic trails and the feeling of solitude and historical association.

For APD related actions, impacts to diverse cultural resources might greatly increase. The lack of the standard cultural stipulation would lead to greater site destruction as well. If subsurface materials were located during construction, project shutdown might not be possible to allow for salvage of the encountered material. Unrecognized historic trail segments could also be disturbed for reasons stated above.

For the remaining issues, see discussion under Existing Management.

Short-Term Use Vs. Long-Term Productivity

Short-term land use under this alternative would probably result in adverse impacts to cultural resources because stipulations and restrictions upon oil and gas related actions that protect cultural resource values would be lessened. Direct and indirect adverse effects to cultural resources would result.

Unavoidable Adverse Impacts

Unavoidable adverse impacts to cultural resources would increase, perhaps dramatically, under this alternative. Avoidance of cultural properties, a facile and preferred alternative, would only frequently occur.

Irreversible and Irretrievable Commitment of Resources

More and greater irreversible and irretrievable commitments of cultural resources would occur under this alternative as protective measures that prevent impacts to cultural properties would be lessened.

Conclusion

This alternative would result in the greatest degree of irretrievable loss of cultural resources.

Restrictions on activities associated with the forestry program are reduced compared to Existing Management. Costs of forestry operations would be reduced and soils, water resources, and fisheries would be adversely impacted until reforestation is established. Yield of forest products would not be likely to change.

The impacts from disposal of lands in Star Valley would be the same as under Existing Management.

There would be reduced costs to logging operations because the requirement to cross perennial drainages only at constructed crossings would be eliminated. This would also result in slightly higher revenues for the government from timber sales.

RECREATION

Geophysical lines would be allowed into big game crucial winter ranges year round. This could have some adverse impacts on big game which would lead to adverse impacts on hunting. Hunting areas (Map 4) would be open to seismic operations during hunting seasons. This would result in adverse impacts to hunting. Big game may flee areas when seismic operations are underway. There may be conflicts between hunters and seismic operators. These direct effects may result in a slight decrease in hunting expenditures in the KRA.

The open ORV designations would continue to result in impacts similar to those identified under Existing Management.

The reduced restrictions on oil and gas exploration and development would result in the greatest degree of adverse impacts to visual resources of any alternative.

As under Existing Management, oil and gas access roads would also increase access to sites with recreation potential.

If Congress decides against wilderness designation for the Raymond Mountain WSA, the area would again be leased for oil and gas with standard stipulations. This would result in a loss of primitive values in the area. Although the ACEC would be dropped, stipulations would be attached to APDs to protect the sensitive Bonneville cutthroat trout. This would mitigate potential adverse impacts to the trout and its habitat.

FORESTRY RESOURCES

ENVIRONMENTAL CONSEQUENCES

Short-Term Use Vs. Long-Term Productivity

The long-term productivity of the KRA to provide big game for hunting may be diminished due to loss of some habitat. Areas where surface disturbing activities take place would be reclaimed. However, there would not be time limits set for reclamation once these areas have been reclaimed, long-term productivity would be maintained. There would be some loss in long-term productivity due to uncontrolled ORV use and its concomitant loss in vegetative cover and increase in erosion.

Unavoidable Adverse Impacts

Continued oil and gas development and unrestricted ORV use would continue to result in loss of habitat and adverse impacts to soils, vegetation, and big game. This would result in some adverse impacts to hunting. Primitive values in the Raymond Mountain WSA would be lost where oil and gas development takes place.

Irreversible and Irretrievable Commitment of Resources

Primitive values in the Raymond Mountain WSA would be irreversibly altered.

Conclusion

While oil and gas development may increase access to areas with recreation potential and ORV use would be essentially unrestricted, this alternative would result in the greatest degree of adverse impacts to recreation resources. It would also have the greatest degree of adverse impacts on primitive values and the feeling of solitude in the Raymond Mountain WSA.

FIRE MANAGEMENT

The KRA would be divided into nine fire management areas. A fire management plan would be developed detailing the prescription for each fire management option within the nine areas (See Figure 4-1). This plan would describe the process by which resource managers would decide on which course of action to pursue under a wildfire situation, i.e., full suppression, limited suppression, or prescribed fire management.

The impacts to fire management would result primarily from the prescribed fire option. The role of prescribed fire in resource management would be increased. During development of the fire

management plan, management constraints from resources such as livestock management, wildlife, soils, watershed, forestry, or minerals would be considered in formulating the parameter under which a wildfire would be allowed to burn.

Road construction for oil and gas activities would increase accessibility in the KRA. This would assist fire management activities for both wildfire suppression and prescribed fire planning and implementation.

Development of AMPs and RAMPs would assist in development of objectives for the nine fire management areas.

Short-Term Use Vs. Long-Term Productivity

Implementation of a Fire Management Plan would provide for management of fuel types resulting in a reduction in the potential for large scale wildfires in the KRA.

Unavoidable Adverse Impacts

Some surface damage and soil disturbance would result from the use of heavy equipment during fire suppression activities. Limited short-term adverse impacts to aquatic animals may result from the use of phosphate-based fire retardants.

Irreversible and Irretrievable Commitment of Resources

No known unrecoverable losses of resources would be expected as a result of the fire management program. Fires that threaten developments would be suppressed. In addition, fires during drought years and burning under weather conditions that are conducive to erratic fire behavior would be minimized. Therefore, irreversible and irretrievable commitments of resources would be minimized.

Conclusion

Parameters would be defined that would allow for the use of wildfire as a management tool. The total acres burned under this alternative would be greater than under Existing Management. Oil and gas activity, AMPs, HMPs, and RAMPs would assist in planning for and executing Fire Management Plans.

SOCIOECONOMICS

ENVIRONMENTAL CONSEQUENCES

Livestock - With the implementation of grazing systems and development of range improvement projects on 18 allotments, livestock AUMs on "I" allotments would increase a total of about 31,900. As indicated by Appendix I-2, this AUM increase would occur during the first 30 years of the analysis period at an average, annual rate of slightly over 1,000 AUMs. The annual, available Federal AUMs then would be about 193,900 at the end of 30 years.

The change in AUMs translates into an average, annual increase in livestock sales of about \$18,000 and in ranch income of over \$4,000 during the adjustment period. However, these increases are relatively small when related to the more than 800 ranches in the three counties in the KRA, or to the 204 permit/lease holders in the "I" allotments.

Following the adjustment period, ranchers, jointly, could be earning over \$132,000 above current levels each year during the last 20 years of the analysis period. This assumes that their herd sizes and livestock sales increase to take advantage of higher AUMs, and are kept at these levels. Higher ranch income, in turn, would raise regional income an average of over \$17,000 per year higher during the adjustment period, leaving it about \$517,000 above current levels each year thereafter. As shown in Table 3-24, total farm and non-farm earnings for the KRA topped \$105 million in 1981, and the expected post-adjustment income increase under this alternative is less than 0.5 percent of this \$105 million level.

Recreation/Wildlife - The changes projected for AUMs in this alternative would also benefit wildlife, helping to offset possible adverse impacts to wildlife habitat from resource actions other than livestock management. Slightly higher hunter recreation days are projected for this alternative. This translates into an average of over \$4,800 per year in added annual expenditures by recreationists during the adjustment period. In each of the years that the plan remains in effect following the adjustment period, annual recreation expenditures would top present levels by \$145,000, causing a corresponding \$315,000 annual improvement in business activity.

Net Regional - The net regional impacts from the combined changes in the livestock and recreation sectors (as shown in the last six rows of Appendix I-2) indicate that average, annual business activity would climb by over \$47,000 during the first 30 years of the analysis period, and remain over \$1.4 million higher than current levels each year thereafter. Compared to the \$105 million total farm and non-farm earnings of 1981,

this change probably equals less than a 1 percent increase in total KRA business activity.

Employment - Employment impacts from this alternative would be negligible during the adjustment years and are not anticipated to produce measurable social impacts within the KRA. An average of less than one new employee per year would be needed in either the agricultural or recreation sectors of the economy. Over the total analysis period, this alternative would result in new jobs for about 20 people.

Livestock Benefit/Cost Analysis - The net present value from benefits and costs realized under livestock management would be slightly over \$1 million and the benefit/cost ratio shows that for every dollar expended, a benefit of 1.65 dollars would be realized (Appendix I-3).

ALTERNATIVE B

AIR QUALITY

Although some extra expense might be incurred by oil and gas operation for proposed new H₂S contingency requirements, the levels of development should remain the same as under Existing Management. In general, however, greater protection would be afforded to the public and resource values if an accidental release of H₂S does occur.

Short-Term Use Vs. Long-Term Productivity

Same as Existing Management.

Air resource impacts would remain the same as under Existing Management. Short term increases in ambient concentrations of some air pollutants would happen due to construction of planned pipelines, compressor stations, sweetening plants, and other industrial activities. These would not be of any greater magnitude and duration than what is now occurring or will occur. Some increased particulates (smoke) might be added to the atmosphere from range improvement controlled burns on up to 136,960 acres but these would be of short duration and of very minimal impact.

Unavoidable Adverse Impacts

Same as Existing Management.

ENVIRONMENTAL CONSEQUENCES

Irreversible and Irretrievable Commitment of Resources

Although some increase in windborne dust might occur due to increased grazing, BLM range management practice would reduce the loss of topsoil due to wind erosion, to very minimal amounts. Increases to ambient atmospheric concentrations of particulate would be very low.

Conclusion

Same as Existing Management except that the potential impacts to public health and safety would be reduced due to increased requirements for a dispersion analysis in areas where releases of H₂S are more likely.

GEOLOGY AND MINERALS

Time delays and costs for oil and gas development would be slightly increased over Existing Management due to new stipulations or conditions on leases and APDs. Additional seasonal delay would be caused by a lease stipulation prohibiting new drilling in domestic sheep lambing areas during critical periods. APDs would be screened to check for location in landslide-prone areas and, if movement of the proposed well site was found to be necessary, the result could be added expense and time delay.

An added cost over current requirements for H₂S safety plans would result from the requirement for an air dispersion analysis, as well as possible mitigating measures which would be required as a result of the study.

Initial reclamation costs for well sites would increase over Existing Management as a result of the requirements for an erosion rehabilitation and reclamation plan (ERRP), soil inoculation, fertilizing, and fencing. Snow fences and matting for moisture retention and erosion control would also add to reclamation costs. Long-term reclamation costs would be less, assuming that the new reclamation procedures lessen the need for repeated re-seedings to establish vegetation.

An offsite mitigation plan to improve livestock facilities would add to well site costs; the amount would depend on the types and quantities of range improvements.

Delays to geophysical exploration caused by the stipulations would generally be of the same magnitude as Existing Management. Additional

temporary delays may result from closing parts of the KRA due to muddy conditions.

Impacts from restrictions on mining in riparian areas would be the same as Existing Management.

Short-Term Use Vs. Long-Term Productivity

In the short term, production of oil and gas may be delayed as more stringent standards are implemented. In the long term, little significant reduction in total oil and gas production is foreseen.

Unavoidable Adverse Impacts

Same as Existing Management.

Irreversible and Irretrievable Commitment of Resources

Same as Existing Management.

Conclusion

Costs and delays are expected to be slightly more than under Existing Management, however, the level of production of oil and gas is not expected to be different than under Existing Management.

SOILS

Reductions in soil compaction and ground cover loss would be the beneficial long-term impacts realized through seasonal stipulations concerning wet conditions. The requirement for BLM to determine restricted periods would avoid operator negligence. Reclamation of geophysical exploration trails would attain higher success rates due to reductions in excessive disturbance.

Rerouting of roads and locating drill pads outside landslide prone areas (Map A), would help to avoid unreclaimable disturbances and associated erosion. Disturbances caused by mining in riparian zones would continue impacts reflected in Existing Management. Initiation and use of the ERRP will identify goals of reclamation and provide needed information to meet reduced reclamation time frames. The four year reclamation plan would stabilize soil within a shorter period than Existing Management and Alternative A, thus eliminating approximately one to four years of additional accelerated

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erosion. The use of inoculation, fertilization, moisture catchment, fencing and erosion control materials would increase reclamation success rates within reduced time frames.

The development of AMPs and interagency co-op management plans would result in long-term beneficial impacts on soils within 39 allotments. Range treatment would be conducted on 136,960 acres. Short-term soil loss would occur on 39 allotments due to initiation of new range improvements, with long-term increases in vegetative cover protection from improved distribution. Breakdown of steep streambanks, due to lack of exploration restrictions, would provide easy access to water for livestock and reduce reclamation success due to trampling. During early season grazing, compaction from livestock in wet meadows and subirrigated areas is likely to be greatest, due to livestock within riparian zones.

Logging would continue to contribute loss of soil and sedimentation due to fewer restrictions on stream crossing, however, exclusion of road construction in riparian and wet areas would mitigate these losses.

The impacts from unrestricted ORV use would continue to equal those under Existing Management.

Fencing, secondary seeding and blocking access would decrease accelerated erosion and increase reclamation success on rights-of-way.

Lack of year-round avoidance areas for rights-of-way and open designation for road construction would retain the potential for accelerated soil loss in areas of critical erosion hazard.

Short-Term Use Vs. Long-Term Productivity

Short-term use involved with geophysical exploration is projected to have insignificant impacts to long-term soil productivity due to avoidance of activity during wet conditions. Movement of proposed drill sites and related roads away from high landslide potential areas will decrease potential for loss of soil productivity due to mass wasting.

The inoculation of topsoil, fertilization, and fencing of disturbances would maintain or improve long-term soil productivity.

Use of snow and moisture catchment in reclamation procedures will increase long-term soil productivity in areas of limited precipitation. Any implementation of AMPs over the short term will increase long-term soil productivity through

distribution of compaction potential and protection of ground cover. Short-term soil loss due to vegetation manipulation (139,960 acres) and construction of range improvements on 39 allotments, will result in long-term increases in soil productivity as in Existing Management. Loss of long-term soil productivity related to breakdown of streambanks due to logging equipment will continue as in Alternative A. Use of fencing and access blockage along ROW will protect reclamation efforts and maintain soil productivity through avoidance of vehicular compaction.

Unavoidable Adverse Impacts

Unavoidable soil losses in the short term can be associated with any disturbance (i.e., oil and gas, livestock, construction) although mitigation, such as successful reclamation, would reduce these to insignificant impacts over the long term.

Irreversible and Irretrievable Commitment of Resources

Irretrievable soil loss would continue due to surface disturbance, however, levels of soil loss will be minimized due to use of an ERRP (outlining reclamation goals), a four-year timeframe for reclamation and use of soil stabilizing species in the reclamation prescription.

Irreversible soil loss and diminished productivity associated with landslides will be minimized through avoidance of high landslide potential areas.

Conclusion

The additional requirements for reclamation of disturbed areas is likely to result in beneficial impacts to the long-term productivity of the area. While reclamation procedures would emphasize species palatable to livestock and there would be an increase in AUMs for livestock, the reclamation procedures and restrictions on oil and gas development would result in less soil loss and more stabilization than either Existing Management or Alternative A.

WATER RESOURCES

The adverse impacts to water resources would be less than under Existing Management levels. Implementing seasonal restrictions on both

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geophysical and oil and gas would decrease erosion and sedimentation rates, reduce bank sloughing, riparian impairment and headcutting problems. The development of the ERRP would reduce sediment yields greatly as oil and gas disturbances constitute a major source of sediment. The ERRP would enhance establishment of vegetation which, in turn, would improve infiltration, reduce surface runoff, and minimize erosion. As a result, water quality would improve and sustained yield would increase from both the implementation of the ERRP and AMPs on 39 "I" allotments.

Short-Term Use Vs. Long-Term Productivity

As a result of oil and gas exploration, short-term impacts to water quality in the form of high suspended sediments would be realized. Because of the restriction on exploration and an active reclamation plan, this would be a short-term impact.

Long-term impacts, as a result of unrestricted livestock grazing in riparian areas, could result in channel degradation. Such degradation could initiate channel regrading which would provide for high suspended sediments in the water for some time.

Long-term impacts may be realized to groundwater as a result of drilling and waste water injection.

Unavoidable Adverse Impacts

Unrestricted grazing would pave the way for greater runoff as a result of vegetation removal and soil compaction. This may be minimized, but not eliminated, with proper grazing management. Unrestricted grazing in the riparian areas would increase stream side perturbation as the vegetation is removed.

Erosion from oil and gas exploration roads and trails would introduce sediment into surface waters. However, reclamation would help limit the length of time accelerated erosion would take place from a particular surface disturbance.

Irreversible and Irretrievable Commitment of Resources

Channel perturbation and floodplain compaction from unrestricted livestock grazing could trigger a regrading of stream channels. This would result in the formation of a new channel system that would introduce a high suspended sediment load for some time to come.

Irretrievable impacts could be realized to the groundwater as a result of oil and gas exploration and waste water injection.

Conclusion

Unrestricted livestock grazing would have adverse impacts on water quality as a result of too much vegetation removal and soil compaction on side slopes as well as in the riparian areas. This could lead to channel realignment and regrading as a result of unstable stream banks and increased runoff from adjacent areas.

LIVESTOCK MANAGEMENT AND VEGETATION

An additional 46,414 AUMs of total vegetation would become available, dependent upon implementation of grazing systems and installation of range improvements and vegetation treatments on 39 "I" category allotments (see Appendix A-2 for types and numbers of range developments under this alternative).

Monitoring would determine the actual amount of available forage. Once total preference on an allotment is reached, additional AUMs would be allocated according to allotment specific objectives with proportional amounts of livestock, wildlife, and watershed.

The proposed implementation of range developments would have the same general impacts on range resources as described under Existing Management and Alternative A, but to a greater magnitude. Livestock distribution would be greatly improved and total livestock forage production would increase. The major long-term consequence to vegetation would be a significant increase in the production of desirable forage plants, and availability of forage, as well as the restoration of productivity on denuded sites that show potential for improvement. Careful placement of range improvements and proper design are effective in the mitigation of the adverse impacts associated with these projects.

The addition of approximately 646 AUMs of licensed livestock grazing preference from lands previously outside of grazing allotments would impact livestock operators favorably.

The impacts associated with geophysical exploration would be virtually the same as those

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discussed under Existing Management.

The impacts associated with oil and gas development would be identical to those described under the Existing Management with the exception that sheep lambing areas would be protected from all oil and gas drilling activities during that period critical to lambing operations.

Conclusion

An increase of approximately 46,414 AUMs would be realized. Poor to fair condition ranges on "I" category allotments would be expected to improve. "M" and "C" category allotments in poor to fair condition would be managed to prevent further deterioration. Riparian habitats would be managed for a stable trend in range condition.

FISH AND WILDLIFE HABITAT

Impacts from geophysical exploration would be similar to those outlined under the Existing Management alternative, with one exception. Reclamation of riparian areas would include reseeding with preferred livestock forage species. This would increase livestock use of riparian areas causing increased bank erosion, decreased channel stability and an overall decline in fisheries habitat.

Impacts from oil and gas development would be the same as under Existing Management, except as described above and the expectation that additional reclamation requirements would have a more beneficial impact on wildlife in the long term than either Existing Management or Alternative A. Livestock production would be emphasized causing adverse impacts to big game range and riparian habitat. Water developments in winter ranges would concentrate livestock and wildlife use during the summer causing a reduction in forage availability for wintering big game. Spraying or burning to convert sagebrush to grassland in mule deer and antelope crucial winter range could reduce forage availability for those species if wildlife goals are not considered during planning. Adverse impacts to sage grouse would also occur from vegetation manipulation activities in nesting areas. Riparian areas would continue to receive heavy grazing pressure and would continue in a downward trend except where AMPs provide rest or deferral to these areas. Fisheries habitat would be degraded by increased livestock use of riparian areas. In the Smith's Fork

Allotment, any further decline in habitat quantity or quality for the Bonneville cutthroat trout may result in its being officially listed as a Threatened or Endangered Species.

Completing the Woodruff Narrows HMP would maintain or improve bald eagle roosting habitat that supports from 40 to 200 wintering eagles.

Retaining lands with grazing values would have the same impacts to wildlife as described for Existing Management.

Impacts of rights-of-way management would be similar to Alternative A, except that fencing and blocking access would reduce road densities and improve reclamation success thereby benefitting wildlife.

Short-Term Use Vs. Long-Term Productivity

Surface-disturbing activities would result in about the same reduction in short-term productivity as under Existing Management. The provision which emphasizes livestock forage species in seed mixtures for reclamation, would help return long-term productivity. However, the area may not be as beneficial to wildlife as it would under Existing Management.

Unavoidable Adverse Impacts

There would be both direct and effective habitat losses from surface-disturbing activities. This would occur to approximately the same degree as under Existing Management.

Irreversible and Irretrievable Commitment of Resources

No irreversible and irretrievable commitments of wildlife resources are expected.

A more in-depth sour gas dispersion analysis and other protection measures would be undertaken on new gas fields with high H₂S potential, protecting livestock from sickness and death.

Closure of muddy areas to vehicle use would create fewer impacts to vegetation and livestock forage than under Existing Management.

Reclamation of temporarily disturbed areas would have virtually the same impacts to livestock and vegetation as those described under Existing Management. These areas include pipelines, roads, and abandoned oil and gas wells. Snow fencing and fertilizer

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applications would enhance forage production on reclaimed areas. Vegetation condition would improve over the long term on these sites.

Offsite mitigation practices to favor livestock grazing would have desirable impacts. New range improvements would improve forage availability and quality for livestock.

The impacts from timber harvesting operations are expected to be the same as those discussed under the Existing Management situation.

The impacts of road construction would also be the same as under Existing Management except that upland areas and wet meadow areas would be protected.

Impacts to livestock from ORVs would be similar to those described under Existing Management.

Grazing leases in the Star Valley and near Evanston would continue to be administered by the Federal government. Livestock operators would not be adversely impacted through the Lands disposal program.

Seasonal restrictions on rights-of-way construction in sheep lambing areas would limit adverse impacts to lambing operations. Sheep trailing routes would be protected from construction activities.

The impacts from fire management are the same as those described under Alternative A but there would be a greater short-term decrease in forage and long-term increase because up to 136,960 acres would be subject to prescribed fire rather than 82,610 as in Alternative A.

Short-Term Use Vs. Long-Term Productivity

Long-term impacts from geophysical exploration, oil and gas development, the coal program, etc. would be reduced. Reclamation of surface disturbances would favor production of forage for livestock. Limited short-term adverse impacts such as soil disturbance and vegetation removal would result from the development of range improvements and implementation of grazing systems. Long-term productivity would increase by approximately 46,414 AUMs as a result of these developments.

The weed and pest control program would retard further spread of noxious weeds. Continued use of the sheep trails would reduce the impacts to the allotments being trailed through. The predator control program would enhance the long-term earning capacity of the livestock industry, in general, and the sheep

industry in particular. The removal of the remaining 62 wild horses from the KRA would have a long-term, beneficial impact.

Unavoidable Adverse Impacts

Some short-term adverse impacts from surface disturbance and disruption of livestock operations would occur. These short-term impacts would be mitigated by increases in long-term productivity.

Irreversible and Irretrievable Commitment of Resources

Limited vegetation would be lost through minerals development. This would result in a small loss of forage for livestock.

Conclusion

Oil and gas development and emphasis on livestock would reduce the long-term productivity of the resource area for wildlife and potentially for wildlife related activities (e.g., recreation). Wyoming Game and Fish objective numbers may not be met due to increased competition from livestock.

LAND RESOURCES

Some of the Star Valley parcels shown on Map 7 and listed in Appendix D are not suited to management by either the Idaho BLM or the USFS. Other parcels are suitable and, if transferred, the grazing use might need to be changed to fit the appropriate agency's land use plan. If the Forest Service indicates they would cancel grazing rights, the KRA would retain the lands.

Retaining lands with grazing improvements would protect the grazing allottees' interest. Exchanging land with the ranchers in the checkerboard would create solid block private and federal. This would improve management of the federal lands and probably the private lands, as well. Any actions taken to improve management would be taken on larger blocks of land. They would be more effective for many management actions, especially those directed at improving wildlife habitat or range condition.

An adverse impact of exchange would be the high cost of completing the land action. In areas where there are common use allotments, it would be difficult to arrange equitable exchanges. Most likely, one rancher would suffer a reduction while

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another would benefit from an increase in formerly leased AUMs.

The impact on right-of-way holders from seasonal restrictions on lambing areas and from trailing stipulations would usually be minimal, although significant time delays may occur.

The impacts associated with fencing, blocking access, and secondary seeding would increase costs for the right-of-way holder. Secondary seeding with species palatable to livestock would be required in some locations after ground cover was established. This would also increase the costs for the right-of-way holder and necessitate spending more time on rehabilitation before being released from responsibilities associated with the right-of-way.

The impacts of individual communication rights-of-way would be the same as those described in Existing Management.

The impacts associated with access acquisition are the same as described in Alternative A. The roads assigned priority for acquisition would be those most beneficial to the range program.

Short-Term Use Vs. Long-Term Productivity

Restrictions on rights-of-way would result in increased costs to right-of-way holders in order to maintain the long-term productivity of the resources.

Unavoidable Adverse Impacts

Increased right-of-way restrictions may slightly increase costs and result in modest delays for some right-of-way holders.

Irreversible and Irretrievable Commitment of Resources

No irreversible and irretrievable commitments of wildlife resources have been identified.

Conclusion

Disposal of lands in Star Valley and other portions of the resource area which meet the disposal criteria is not expected to adversely impact the long-term productivity of the area. The stipulations placed on rights-of-way would help maintain long-term productivity and would be more effective in that regard than Existing Management.

CULTURAL RESOURCES

Impacts to cultural resources, especially historic trails, would be reduced because seismic operations would be restricted during muddy conditions. The historic trails can be damaged to a much greater degree when muddy conditions prevail. Some buried prehistoric sites would be subject to destruction or disturbance from such activities as vehicle traffic during muddy conditions but they may remain unharmed during drier periods.

The impacts from oil and gas exploration and development, reclamation, wildlife, recreation, and access issues are similar to those discussed under Existing Management.

The transfer of lands from KRA to the Forest Service or Idaho BLM would not affect management of cultural properties because they would not leave the Federal system.

Short-Term Use Vs. Long-Term Productivity

Little effect in the short term would occur to cultural resources although adverse effects to the historic trails may increase.

Unavoidable Adverse Impacts

Few unavoidable adverse impacts to cultural resources would result under this alternative.

Irreversible and Irretrievable Commitment of Resources

Any increase in disturbance to riparian zones might result in irreversible or irretrievable commitments to cultural properties but this effect would be slight.

Conclusion

Adverse impacts to cultural resources would be slightly greater than under Existing Management primarily due to the effects of increased livestock in riparian areas. These losses would be irretrievable.

FORESTRY RESOURCES

The impacts on forestry resources would be similar to impacts under Existing Management. Some of the additional requirements to reclaim

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surface disturbances may have a beneficial effect on forestry resources, but may result in a slight increase in costs to logging operations.

The impacts from disposal of lands in Star Valley would be the same as under Existing Management.

There would be reduced costs to logging operations because the requirement to cross perennial drainages only at constructed crossings would be eliminated. This would also result in slightly higher revenues for the government from timber sales.

RECREATION

These impacts would be the same as those identified under Existing Management except that the increased number of AUMs provided under this alternative may result in an increase in the number of conflicts between livestock operators and ORV users.

If Congress decides against wilderness designation for the Raymond Mountain WSA, the ACEC would be retained by ORV closures and stipulations on oil and gas leases to protect

recreation and wildlife values.

FIRE MANAGEMENT

Same as Alternative A.

SOCIOECONOMICS

Livestock - The emphasis is on livestock production in this alternative. The implementation of grazing systems that call for range improvements and vegetation treatments on 39 of the "I" allotments is expected to increase forage and raise annual available Federal AUMs by 46,414 to a total of over 208,414. This adjustment is expected to require 30 years to complete with average, annual increases of approximately 1,550 AUMs.

During the adjustment period, ranch income would enjoy average, annual increases of over \$6,000 and livestock sales receipts would rise by about \$26,000. The positive average impact of these changes on the KRA business activity would be over \$54,000 a year for these first 30 years.

Once the higher AUM level is reached, yearly ranch income would be over \$193,000 higher and livestock sales more than \$783,000 greater than present levels. This would raise annual regional income by over \$752,000 and yearly business activity by over \$1.6 million. However, this business increase is less than 2 percent above total annual farm and non-farm earnings reported for 1981 in Table 3-24.

Recreation/Wildlife - Under this alternative, oil and gas development and livestock production are expected to reduce the long-term productivity of the KRA for wildlife and related activities. Even though Wyoming Game and Fish objectives for wildlife numbers are expected to be maintained, hunter recreation days are projected to experience an average, annual decline of 370 during the first 30 years of the analysis period (Appendix I-2). By the end of this adjustment period, annual recreation days will have dropped to 31,200 from the present 42,180 level, a change of over 25 percent (Appendix I-1).

The projected decline in annual recreation days and the resulting drop in recreational expenditures would adversely impact total business activity in the KRA by an average of slightly over \$30,000 per year during the first 30 years of the analysis period. Each year after the adjustment period, total business activity attributed to the recreation sector would be almost \$923,000 below present levels. Earnings in the retail trade and services sectors totaled over \$62 million in 1981 in the three counties in the KRA, and the expected changes in business activity listed above would be approximately 1.5 percent of that 1981 level (Table 3-24).

Net Regional - There is a positive net impact on KRA income and business activity from changes in the livestock sector. Positive returns from increased livestock output outweigh losses attributed to declines in the recreation/wildlife sector. As a result, there would be an average of over \$23,000 of additional annual business activity during the first 30 years of the analysis period. During each of the following years, annual business activity would be approximately \$703,000 higher than current levels.

Employment - Projected increases in employment due to increased livestock production would be more than offset by employment declines in the recreation/wildlife sector. By the end of the adjustment period, there would be a net loss to the KRA of about 4 positions. However, there could be some internal

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readjustments by workers as the livestock sector gains about 8 to 9 workers while the recreation sector loses 17 to 18 and the rest of KRA businesses readjust services and employees to respond to the changing conditions. How socially disruptive these adjustments would be to the KRA is unclear. Since changes are assumed to happen slowly over 30 years, the KRA can probably adjust to these changes without much stress to individuals or businesses.

Livestock Benefit/Cost Analysis - Livestock management of "I" allotments under this alternative would result in a minus \$5,467,256 net present value as benefit losses to wildlife and recreation offset positive benefits realized by the livestock sector. The benefit/cost ratio also is a negative 1.15, indicating that each dollar in costs expended by management actions would be accompanied by an additional \$1.15 in lost benefits.

ALTERNATIVE C

AIR QUALITY

Same as Existing Management except for the additional provision for dispersion analyses in H₂S areas, and a potential for a slightly higher degree of short-term impacts from smoke generated from up to 33,500 acres of prescribed burns.

Short-Term Use Vs. Long-Term Productivity

Same as Existing Management, except that air pollution (i.e., particulates and hydrocarbons) may increase slightly from possible increased hunter vehicle miles during seasonal use.

Unavoidable Adverse Impacts

Reductions in air quality and visibility from planned developments and oil and gas development would be similar to Existing Management.

Irreversible and Irretrievable Commitment of Resources

Same as Existing Management.

Conclusion

Same as Existing Management except that there would be additional protection for public health and safety in H₂S areas.

GEOLOGY AND MINERALS

This alternative would contain the most "no surface occupancy" and "no leasing" areas compared, resulting in the least amount of area available for development of oil and gas. This is due to the addition of "no surface occupancy" areas around bald eagle roosting areas, on slopes of more than 40 percent, on wet meadows or subirrigated areas, and additional area around live water and historic trails. Also, wildlife conditions would be added to APDs if they were not already on the lease, which may result in some additional delays on APDs.

As a result of withdrawals for wildlife (87,809 acres) would be removed from oil and gas leasing which could result in the loss of some of the federal oil and gas resource. These withdrawals include withdrawals for big game winter range and for raptor roosting areas. Also, offsite mitigation would be required for wildlife which would increase costs to companies.

Reclamation requirements would cause more cost increases on initial reclamation than Existing Management. Riparian area disturbance would require enhancement of riparian habitat and/or offsite mitigation. The requirement to use bridges for crossing riparian areas would result in a very large cost increase over other methods. Requirement for use of herbicides in areas of weed control problems would add to costs, as would topsoil inoculation, fertilizing, fencing, and construction of snow fences. Over the long term, reclamation costs may be lower than under Existing Management, assuming reclamation practices under this alternative are more successful. This would be true as long as reclamation is required and compliance with that requirement is monitored.

The requirement for offsite mitigation for wildlife habitat enhancement would also add to costs associated with development. The cost increase would depend on the degree and type of mitigation.

This alternative would have the most restrictions on geophysical lines, with the exception of the sage grouse stipulation, which would be less restrictive. Areas of closure for seasonal use, such as in big game winter ranges and hunting areas, would be greatly expanded

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and less flexible, resulting in many more time delays compared to Existing Management unless drilling equipment could be scheduled to operate in other areas when these restrictions are operative. The “no surface occupancy” provision relating to live streams would also remove surface area from lands available for drilling. This would result in increased cost and some interruptions in geophysical lines.

No placer mining would be allowed in riparian areas. As there is no placer mining at present in the KRA and none is anticipated, restriction would have little impact.

The restriction of no gravel sales in riparian areas would have little impact on the program since most sales are on old terraces which are now elevated above the riparian zone. Other mining activities, if any, would have increased costs due to mitigation of impacts in riparian areas.

Short-Term Use Vs. Long-Term Productivity

Short-term use of oil and gas exploration and drilling would be slowed compared to Existing Management due to increased restrictions. Long-term productivity of other resources would increase compared to Existing Management while long-term oil and gas production may be reduced. This depends, in part, on whether surface restrictions affect drainage of potential new discoveries. Many of the restrictions are in areas of wildcat drilling where the location and timing of future discoveries cannot be accurately predicted.

Unavoidable Adverse Impacts

Costs to oil and gas operators would be highest under this alternative.

Irreversible and Irretrievable Commitment of Resources

Same as Existing Management.

Conclusion

Restrictions on oil and gas operations would be greatest under this alternative. This may cause operators to move into areas with fewer restrictions. This would have the potential for reducing oil and gas drilling from the KRA but probably not from the region as a whole.

SOILS

Long-term impacts from geophysical exploration include those discussed in Alternative B with additional protection of streambank stability and reclamation success. Under this alternative, impacts associated with geophysical exploration would be minimized and mitigated through closures during wet periods, use of soil stabilizing species in reclamation, and use of established road crossings or temporary bridges on stream crossings. Leasing stipulations including “no surface occupancy” in riparian areas and development restrictions on slopes greater than 40 percent would reduce potential for soil erosion and promote reclamation success. Withdrawals from leasing would avoid any impacts to soils.

Reclamation goals primarily promoting soil stabilization in riparian and upland areas within a four-year period would minimize off-site sedimentation impacts and on-site erosion. Minimal impacts to soils from mining within riparian zones and logging, due to restrictions on stream crossings, use of bridges, and “no surface occupancy” stipulations, could be expected.

The impacts from grazing would be similar to those of Existing Management, with increases in watershed protection due to development of additional AMPs and allocation of additional forage to watershed protection. Vegetation manipulation would be conducted on 33,500 acres with general long and short-term impacts similar to Existing Management. However, the degree of impacts would be slightly greater because of the increase acreage. Protection of riparian zones through lowering acceptable utilization levels and development of compatible grazing systems would have long-term positive impacts in overall watershed stability. Increased numbers of HMPs and continuation of existing ACECs would provide high levels of management and protection.

ORV use impacts are projected to be insignificant due to “limited” designation and road closures. Designation of minimal access areas (i.e., critical erosion areas) to road construction would avoid impacts similar to oil and gas associated disturbances.

Short-Term Use Vs. Long-Term Productivity

Short-term use involved with geophysical

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exploration is projected to have insignificant impacts to long-term soil productivity due to avoidance of activity during wet conditions, reclamation supporting stabilization, and use of existing stream crossings or temporary bridges. Movement of proposed drill sites and related roads away from high landslide potential areas would decrease potential for soil productivity loss due to mass wasting.

Topsoil inoculation, fertilization, and fencing of disturbances would maintain or improve long-term soil productivity.

Use of snow and moisture catchment in reclamation procedures would increase long-term soil productivity in areas of limited precipitation. Any implementation of AMPs over the short term would increase long-term soil productivity through distribution of compaction potential and protection of ground cover. Short-term soil loss due to vegetation manipulation (33,500 acres) and construction of range improvements would result in long-term increases in soil productivity as in Existing Management.

Protection of riparian zones through decreases in utilization would promote ground cover and increased long-term soil productivity.

Insignificant losses in soil productivity can be projected for logging and mining activities mainly due to avoidance of riparian zones and use of bridges in road construction.

Use of fencing and access blockage along rights-of-way would protect reclamation efforts and maintain soil productivity through avoidance of vehicular compaction.

Unavoidable Adverse Impacts

Unavoidable soil loss can be associated with any disturbance (i.e., oil and gas, livestock, construction), although mitigation such as successful reclamation can reduce these to insignificant impacts.

Irreversible and Irretrievable Commitment of Resources

Irretrievable soil loss would continue due to developmental disturbance, however, levels of soil loss would be minimized due to use of an ERRP (outlining reclamation goals), a four-year timeframe for reclamation, and use of soil stabilization species in the reclamation prescription.

Irreversible soil loss and diminished productivity associated with landslides would be minimized through avoidance of high landslide potential areas.

Conclusion

Restrictions on development and additional reclamation requirements would mitigate adverse impacts most under this alternative. Long-term productivity would be maintained and the irreversible, irretrievable commitment of soil resources would be minimized. Most options for use of the KRA's resources would remain open.

WATER RESOURCES

Overall, the impacts to water resources would be less than under any other alternative because of restrictions on geophysical operations, oil and gas development, livestock grazing, wildlife, and ORV travel. Water quality and sustained yield would improve under changes in the geophysical and oil and gas programs. "No surface disturbance" stipulations, stipulations which restrict surface occupancy within 500 feet of live water, and stipulations which restrict crossing of perennial waters or limit disturbance on slopes over 40 percent would prevent major disturbances to the watershed. As a result, erosion and sedimentation rates would be lower than under Alternatives A and B. Riparian areas are protected from mining gravel and mining in general as well as stream crossings unless by way of bridge. Due to the above, sediment loads would be reduced and debris and high sediment carrying runoff velocities eliminated. The effects from ORV travel limitations would also reduce the adverse effects on water quality that are currently occurring in some areas. The reduction in adverse effects may be most apparent in areas with steep slopes.

Short-Term Use Vs. Long-Term Productivity

Very little damage would be done to the water resources other than some sedimentation from exploration roads but this would be short term due to proper reclamation practices. Restrictions placed on livestock grazing in the wetlands and riparian zones would enhance the water resource.

Long-term adverse impacts may be realized to the groundwater as a result of drilling and waste water injection.

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Unavoidable Adverse Impacts

Erosion from exploration roads would be prevalent but short term with the required reclamation.

Irreversible and Irretrievable Commitment of Resources

Irretrievable impacts could be realized to the groundwater as a result of oil and gas exploration wells and waste water injection. This is not likely to be significant.

Conclusion

This alternative would be the most beneficial to water resources.

LIVESTOCK MANAGEMENT AND VEGETATION

There would be 27,011 AUMs removed from authorization for livestock. These AUMs would then be allocated to support wildlife and watershed resources. Any increases in vegetation from management activities would be allocated to wildlife and watershed, with no increase to livestock.

The impacts from range improvements would be similar to those described under Alternative A, with the exception that watershed, wildlife, and soils would be the primary beneficiaries of improved distribution of livestock, and improved forage cover.

The impacts from construction of approximately 64 miles of fence and livestock trailing along fences would have an insignificant direct impact on vegetation and livestock. Vegetative manipulation on 33,500 acres would benefit range vegetation through improved livestock distribution thereby reducing the effects of concentrated use. Overall vegetation condition should improve and those areas in declining condition should stabilize or improve. A 500-foot buffer next to all perennial streams would protect riparian and other vegetation from surface disturbance. Livestock would benefit from increased forage availability in these areas, and less disturbance due to human activity.

Reclamation of roads, pipelines, abandoned wells, and other temporary disturbances would be intended to benefit wildlife and not livestock. Reseeding with species which would enhance

the forage base for wildlife would make certain areas undesirable for livestock grazing. More browse and forb species would be seeded and would change vegetation community structure. Vegetation condition of reclaimed areas would not improve significantly.

If no conversions in kind of livestock are allowed on a resource area wide basis, adverse impacts to livestock operators would result. Economic hardship, and in some cases economic failure of certain ranching operations could conceivably occur. Reconversion of the total grazing use in the Smith's Fork Allotment to sheep use would cause the economic hardship and/or failure of these ranch operations.

Precluding all placer mining from riparian zones would have a beneficial impact to vegetation and livestock. A minimum amount of vegetation would be removed from these important livestock areas. Livestock watering areas would experience no degradation in water quality. Not allowing gravel sales in riparian areas would have the same positive impacts to livestock and vegetation as described above. Water quality in livestock watering areas may show a slight improvement as a result of using bridges for stream crossings and riprapping to maintain streambank stability.

The limited ORV designation would protect vegetation and livestock from disturbance and harassment to a greater degree than other alternatives.

The impacts from land tenure adjustments would be the same as those described under Existing Management. Rights-of-way impacts are the same as those described under Existing Management.

Closure of the Pine Creek Road and Slide Rock Trail during wet periods would reduce disturbance of livestock and prevent loss of vegetation. Areas in declining vegetative condition should stabilize and improve over the long term.

The impacts from prescribed fire would be similar to those described under Existing Management but they would be slightly more beneficial in the long term because of the greater acreage.

Short-Term Use Vs. Long-Term Productivity

Limited short term adverse impacts would be expected as a result of installation of range improvements and implementation of AMPs. Long-term productivity would be expected to

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increase as in Alternative A but forage increases would be allocated first to satisfy the Wyoming Game and Fish strategic plan for wildlife numbers as well as to meet specific watershed objectives.

Weed and pest control, predator control, use of stock trails, and elimination of wild horse herds would yield the same benefits as described under Alternative A. Long-term impacts from surface-disturbing activities would be reduced under this alternative due to increased stipulation on permits.

Unavoidable Adverse Impacts

Same as Alternative B.

Irreversible and Irretrievable Commitment of Resources

Same as Alternative B.

Conclusion

Active grazing preference would be reduced by 38,180 AUMs. Any future forage increases would be allocated to meet the Wyoming Game and Fish strategic plan for wildlife numbers and as well as to meet specific watershed objectives. No additional forage would be allocated to livestock. Range conditions on "I" category allotments would improve. All other allotments would be managed to prevent deterioration of condition. Riparian area management would be directed toward maintaining or improving current condition by establishing a 40 percent allowable use level on key riparian grass species. This would necessitate herding, fencing, conversion from cattle to sheep, shortened season of use, and other management actions to be taken on the part of livestock operators.

Collectively, the actions taken under this alternative would be intended to minimize surface disturbance and to improve revegetation of disturbed areas. These actions would not be likely to significantly benefit livestock because increases in forage would not be allocated to livestock. However, long-term productivity for livestock would be maintained at current levels.

FISH AND WILDLIFE HABITAT

Geophysical exploration impacts to wildlife would be minimized as much as possible by seasonal restrictions and closures for important

wildlife habitat. The most critical portions of mule deer and elk winter ranges (Map B) would be closed without exception during the winter, eliminating possible conflicts with wildlife. Protection of bald eagle roosting areas would eliminate disturbance and potential abandonment of the site. The impacts to elk calving areas would be essentially similar as under Existing Management, forested areas would be protected from disturbance with seismic lines allowed in non-forested areas within the general calving area boundary.

Erosion and sedimentation in riparian areas would be reduced by the 500-foot buffer zone of no disturbance and by the use of crossings on perennial creeks. Reclamation would favor soil stabilization and establishment of riparian shrubs and grasses resulting in improved fisheries habitat and increased wildlife diversity.

Raptor nest sites for sensitive species would be protected throughout the complete nesting cycle (mating, incubating, fledging) to avoid impacts from disturbance. The impacts to sage grouse would be minimized by not allowing disturbance during the hours lek sites are actually used by birds. The impacts to nesting habitat would be minimal due to the scattered pattern of nest locations.

Most impacts from oil and gas development would be similar to those described under Existing Management. A "no surface occupancy" stipulation for bald eagle roosts would protect these areas from possible development-related impacts. A major benefit to wildlife would be offsite mitigation to increase productivity in big game range lost to development. Habitat improvement projects, such as burning, fertilization or water development, have been shown to dramatically increase wildlife numbers (Barrett, 1979). In addition, the most crucial portions of the elk and mule deer winter ranges and bald eagle roosting areas would be withdrawn from leasing which would protect these areas on public land. These winter ranges total 85,290 acres, approximately 8 percent of the total big game crucial winter range (1,104,581 acres) within the KRA boundary (Map B).

Although the sage grouse stipulation would be less restrictive than Existing Management, the integrity of the lek site would be maintained and habitat improvement would be required to mitigate loss of nesting habitat.

Reclamation to mitigate any loss to riparian habitat and offsite mitigation would minimize impacts to fisheries and riparian vegetation. The use of bridges on perennial streams would

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eliminate any impact to fisheries by allowing free passage.

Fencing and other requirements for reclamation would protect reclaimed sites from grazing until vegetation productivity was increased and the site was stabilized. This would reduce the time required to provide wildlife habitat for big game, sage grouse, and other desirable species.

Grazing impacts would be less than under any alternative except "D." No increase in AUMs to livestock would be allowed until wildlife and watershed objectives had been met. Grazing management practices designed to improve livestock distribution would be implemented in "I" allotments with livestock/wildlife conflicts. This would significantly reduce livestock grazing pressure on key riparian habitat and would improve fisheries habitat, allow reestablishment of productive riparian vegetation, and increase the diversity and density of riparian-associated wildlife. The use of prescribed burning instead of spraying to convert sagebrush to grassland would eliminate potential adverse impacts of herbicides to water quality, fisheries, and riparian habitat caused by run-off of herbicide into drainages or drift during application. Prescribed burns would result in some short-term increases in sediment loads to fisheries habitats.

Eliminating conversions of sheep to cattle in allotments with riparian conflicts would at least maintain trend in condition at current levels. Sheep use of rangeland with hilly terrain and narrow riparian and wet meadow bottoms generally causes fewer riparian problems due to overgrazing. Sheep are herded during most of season (except lambing) to obtain better utilization of upland sites and spend less time in drainage bottoms. Cattle are generally not herded and do not use upland areas until drainage bottoms are severely overgrazed. In addition, riparian areas would receive special consideration in AMPs to ensure that an upward trend in condition resulted. Grazing pressure on key sites would be limited to a 40 percent utilization level which is considered light and would likely result in sustained improvement in condition over the long term.

The impacts from the completion and implementation of four new HMPs would be the same as those combined for Alternatives A and B plus Existing Management. Changing the ORV designation to "limited" would benefit wildlife habitat by reducing the development of new roads and trails. Closing the Rock Creek and Slate Creek big game winter ranges to

snowmobile use would reduce disturbance to wintering animals.

Retaining important wildlife habitat under Federal management would protect its value to wildlife by maintaining multiple-use concepts of management. This would maintain ownership patterns in big game winter range reducing the likelihood of breaking-up its integrity.

The impacts of rights-of-way management would be the most beneficial to wildlife. Blocking access on linear rights-of-way would minimize road densities and maintain levels of escape cover as high as possible. Habitat for Threatened and Endangered Species would be protected by a "no surface disturbance" stipulation.

Closing the Slide Rock trails would reduce road density in an important elk calving area and crucial winter range.

Short-Term Use Vs. Long-Term Productivity

This alternative would have the least degree of adverse impact to the long-term productivity of the KRA for wildlife. The requirement for off-site mitigation for all disturbance in the most important mule deer and elk crucial winter range would help maintain long-term productivity.

Unavoidable Adverse Impacts

Surface disturbing activities would result in the short-term loss of wildlife habitat. These short-term losses are expected to occur at approximately the same rate as under Existing Management.

Irreversible and Irretrievable Commitment of Resources

The wildlife resources irreversibly committed as a result of implementing this alternative would be similar to those committed under Existing Management.

Conclusion

Restrictions on development are greatest under this alternative. It would help maintain long-term productivity for wildlife because of the protection afforded riparian areas and crucial winter range for big game. Wyoming Game and Fish objective numbers for big game would be maintained or exceeded.

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LAND RESOURCES

Parcels with wildlife values that are not suitable for management by another agency or for sale with patent reservations, would be retained by the BLM. The reason these lands have been identified for disposal is because they are difficult and uneconomic for the BLM to manage. This alternative would continue that unsatisfactory situation, possibly resulting in adverse impacts to various environmental components or in an uneconomic and inefficient expenditure of scarce funds to manage the lands properly.

Patent reservations may reduce adverse impacts but they also lower the fair market value of the parcels. The Bureau's ability to include appropriate patent reservations may be limited.

Wildlife habitat would be protected from possible degradation that might occur if the parcels were sold and the subsequent use changed.

Approximately 7,000 acres of land outside of Star Valley would be dropped from further sale consideration due to wildlife habitat values. The acreage converted to private ownership would be lowest under this alternative. Therefore, the additional taxes that would accrue to the county would also be lowest.

Blocking access and secondary seeding with species suitable for wildlife would have the same impacts as those described in Alternative B. The exception would be that wildlife, rather than livestock, would benefit from the secondary seeding.

The stringent seasonal wildlife stipulations would increase time delays and, probably, costs for right-of-way holders. Avoidance areas would cause the realignment of some proposed rights-of-way. These realignments could be costly for the companies. The total disturbed area would be greater in those instances where considerable realignment is necessary to bypass the avoidance areas.

The impacts of communication sites would be the same as described in Alternative A.

The impacts from access acquisition would be the same as described in Alternative A. The resource that would benefit the most from these access priorities would be wildlife.

Short-Term Use Vs. Long-Term Productivity

In both the short and long term, rights-of-way costs would be increased and effectiveness would be decreased.

Unavoidable Adverse Impacts

Costs and delays to right-of-way holders, as a result of increased use of stipulations and avoidance areas, would increase slightly.

Irreversible and Irretrievable Commitment of Resources

Lands sold would be lost to multiple use management.

Conclusion

Land disposal and use of public lands by private parties would be severely restricted by management objectives to protect wildlife habitat.

CULTURAL RESOURCES

Protection of wildlife habitat would have a beneficial effect if any cultural resources are located in these areas.

An increase in the buffer around historic trails would enhance the protection of the trail itself, the viewshed, and the feeling of solitude in some areas. An increase in "no leasing" areas would protect sites potentially threatened by oil/gas development, though lack of inventory of the wells would inhibit baseline data gathering at the Class III inventory level.

Improving vegetative cover would reduce erosion, thus aiding in archaeological site preservation. If vegetative cover is increased to an extent that the ground is not visible, detection of surface sites through a standard Class III intensive inventory would be more difficult. If this occurs, the surficial information that the site contains would not be gathered.

Closing the Raymond Mountain ACEC to vehicles would reduce potential vandalism and illegal artifact collecting of cultural sites in the ACEC; this would result because of less visitor access. Other road closures are proposed to protect pristine historic trail segments.

Retention under Federal ownership of lands in Star Valley or other areas in the KRA, would be beneficial to the cultural resource sites that may exist in these areas. They would continue to enjoy Federal protection.

Short-Term Use Vs. Long-Term Productivity

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Generally, the short-term uses proposed under this alternative are beneficial to cultural resources in the long term. Site preservation is enhanced and less ground is subject to major disturbance.

Unavoidable Adverse Impacts

Few, if any, unavoidable adverse impacts to the cultural resource database are anticipated under this alternative.

Irreversible and Irretrievable Commitment of Resources

Irreversible or irretrievable commitments would be minimized under this alternative.

Conclusion

This alternative would result in the least degree of irreversible, irretrievable commitment of cultural resources. It would also be likely to result in the least degree of discovery of cultural resources.

FORESTRY RESOURCES

The use of bridges and culverts would increase costs for forestry operations but it would help to maintain the fisheries resources. It would not be likely to affect production of forest products.

A portion of the timber base may be retained that would be lost under Existing Management because lands would be retained for wildlife values.

The costs to logging operations from the requirements for equipment crossings of perennial streams would be slightly higher than under Existing Management. The revenue to the government from timber sales would be slightly reduced. The degree of reduction would depend on the density of perennial streams.

RECREATION

Closure of the most important parts of the big game winter ranges to geophysical lines would result in a lesser degree of impact to big game and, consequently to hunting, than would Existing Management. The closures of hunting areas from the beginning of archery season to the end of rifle season and the additional closure of part of the Bear River Divide and Meeks Cabin

areas would also help prevent adverse impacts to hunting. This would reduce conflicts between hunters and geophysical operators and provide perceived increased hunting opportunities. It may also result in a slight increase in hunting expenditures in the KRA.

Oil and gas development would result in a lesser degree of impacts and impacts of shorter duration than would Existing Management because restrictions and reclamation requirements would be increased. Recreation potential and visual resources would be maintained to a greater degree than under any other alternative.

Most of the KRA would be designated "limited" for ORVs. ORVs would be required to use existing roads and trails except for necessary tasks. This would result in more limited access for public interested in hunting and other recreation. Conflicts between livestock operators and ORV users would be reduced. Road closures would enhance primitive and natural recreation values, but reduce access for motorized recreation. Snowmobile use would continue throughout the KRA except for the seasonal closure in the Rock Creek and Slate Creek elk winter range.

If Congress decides against wilderness designation for the Raymond Mountain WSA, the ACEC would be retained and its values would be retained by ORV closures and stipulations on oil and gas leases to protect recreational and wildlife values.

Primitive recreation opportunities would increase and motorized recreation opportunities would decrease in the short term. If recreational facilities are constructed, long-term productivity of the KRA to provide recreation would increase.

Unavoidable Adverse Impacts

Opportunities to use ORVs in an unrestricted manner would be least available under this alternative.

Irreversible and Irretrievable Commitment of Resources

Some recreation resources would be lost due to development associated primarily with oil and gas operations. Other opportunities would be lost due to ORV restrictions.

Conclusion

Recreation resources would receive the

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greatest degree of protection under this alternative, except for fewer opportunities to use ORVs. The important values of the Raymond Mountain WSA and the ACEC would be most effectively preserved.

FIRE MANAGEMENT

Same as Alternative A, except that road access to portions of KRA would be restricted.

SOCIOECONOMICS

Livestock - The major thrust of this alternative is to improve watershed, wildlife, and soils on 23 of the "I" allotments and to prevent further decline in the condition of other allotments. The AUMs allocated to livestock on "I" allotments would decline by 27,011, even though long-term forage productivity of these allotments is expected to improve. Any forage increases would go primarily to wildlife, as would the 27,011 AUMs removed from livestock use.

Accounting for the expiration dates and related issues of existing grazing leases, the forage adjustment period for this alternative is estimated to cover the first 10 years of the analysis period. During that 10 years, average, annual declines in ranch income would exceed \$26,000 and livestock sales receipts would go down about \$58,000. In addition, annual ranch income during the last 40 years of the analysis period would be at least \$261,000 lower than current levels with livestock sales down approximately \$580,000. These declines in the livestock sector would perpetuate roughly a \$1 million drop in both regional income and business activity over the 10-year adjustment period with equivalent amounts each year thereafter. This annual decline is anticipated to be less than 2 percent of total regional income and business activity (Table 3-24).

Recreation/Wildlife - Wildlife numbers are expected to increase under this alternative, leading to a growth in hunter days and, subsequently, in the recreation sector expenditures. However, as shown in Appendix I-2, gains to recreation would be less than half as large as losses to the livestock sector.

Net Regional - During the 10-year adjustment period, there would be a net average, annual decline in sales receipts of about \$39,000. Net business activity would show a corresponding average, annual decline of over \$79,000. For the

last 40 years of the analysis period, net annual sales receipts would be almost \$393,000 below current levels. Annual business activity would be roughly \$792,000 lower than during that same period. Compared to 1981 levels of total business activity alluded to in Table 3-24, this decline is less than one percent and is not expected to cause meaningful socioeconomic impacts for communities in the KRA.

Employment - During an average year in the adjustment period, employment numbers would increase by slightly less than 1 position in the recreation sector and decline by slightly more than 1 in the livestock sector. In total, recreation could gain about 10 positions and livestock lose about 13. The net loss for the region over the analysis period probably would not exceed 3 or 4 positions. This type of change should not result in major social impacts to the KRA but might cause dislocation problems for individuals displaced from the livestock sector during the adjustment period.

Livestock Benefit/Cost Analysis - The "I" allotment livestock management proposals of this alternative return a positive net present value of \$389,317. In addition, the benefit/cost ratio was a positive 1.39, indicating that \$1.00 of management costs returned \$1.39 worth of benefits.

ALTERNATIVE D

AIR QUALITY

Same as Alternative B, except that there would be no short-term adverse impacts from prescribed burning.

GEOLOGY AND MINERALS

The impacts would be similar to those for Existing Management. Slightly higher well site reclamation costs would result from the requirements for an ERRP and for requirements to fertilize well sites.

The impacts on geophysical lines would be the same as Existing Management, except that there would be no restrictions on geophysical lines in domestic sheep lambing areas, thus there may be slightly fewer seasonal delays on geophysical lines.

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Short-Term Use Vs. Long-Term Productivity

Same as Existing Management.

Unavoidable Adverse Impacts

Same as Existing Management.

Irreversible and Irretrievable Commitment of REsources

Same as Existing Management.

Conclusion

This alternative is not expected to result in either a decrease or an increase in oil and gas drilling.

SOILS

The impacts associated with geophysical exploration and oil and gas development under low level management would be similar to those attributed to Existing Management. Enhancement of watershed values is of low priority, with increased erosion rates from oil and gas development expected, due to extended time frames for stabilizing disturbance and lack of total grazing exclusion. The increased erosion rates may be mitigated through use of soil stabilizing species in reclamation prescription. In those areas not experiencing development disturbance, long-term impacts include increased ground cover and natural stabilization of erosive soils due to reductions in livestock AUMs. These beneficial impacts are dependent upon control of unauthorized use.

The three RAMPs would help to preserve or develop recreation potential. If the recommendation from a RAMP is to develop recreational facilities, the use of areas where facilities are developed may increase. However, at this time it is not likely that funding will become available for such construction. Therefore, current patterns and levels of use are expected to remain the same.

Short-Term Use Vs. Long-Term Productivity

The lack of vegetation manipulation would allow existing levels of erosion to continue on approximately 51,085 acres of degraded watershed. This could result in significant impacts to some sensitive watersheds.

The impacts attributed to mining and logging under low level management would equal those in Existing Management.

ORV use impacts would continue to be insignificant due to protection through "limited" designation and closures. HMPs and ACEC would remain protective of watershed values.

No year-round avoidance areas and open road construction designations increase potential for accelerated erosion and productivity loss (critical erosion and landslide areas).

Short-Term Use Vs. Long-Term Productivity

Since, under this alternative, the operator determines saturated conditions, the potential for rutting and compaction caused by geophysical exploration equipment increases along with decreases in long-term soil productivity in areas of disturbances. Oil and gas development would be likely to diminish overall soil productivity due to the lack of slope restriction, possible development within high landslide potential areas, and lack of total grazing exclusion. Use of the ERRP with emphasis on stabilizing disturbance (use of soil stabilizing species) may mitigate the aforementioned impacts. The lack of definite reclamation timeframes may lead to excessive accelerated erosion over long periods, thus decreasing long-term soil productivity from loss of topsoil.

Reductions in livestock use over the short term would reduce ground cover loss and animal compaction and promote long-term increase in soil productivity. In areas experiencing degraded watershed conditions with decadent sagebrush communities, long-term soil productivity would continue to decline due to lack of grass communities (organic matter enrichment) and erosion of soil surface. Relaxing stipulations on equipment crossings and mining development in riparian zones, may increase breakdown of streambanks and vehicle rutting, thus decreasing long-term soil productivity in areas of disturbance.

Long-term losses in soil productivity associated with ORV use would be insignificant due to "limited" designation.

Unavoidable Adverse Impacts

Unavoidable soil loss associated with development occurring under this alternative would equal that of Alternative A, however, use of ERRP should promote successful reclamation through outlining prescriptions and goals.

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Irreversible and Irretrievable Commitment of Resources

Irretrievable soil loss would occur due to projected increases in disturbances caused by geophysical exploration and oil and gas development. Losses would be similar to those under Alternative A, except some mitigation can be expected from use of the ERRP, emphasizing soil stability. Irreversible losses of soil and productivity can be expected when development occurs in high landslide potential areas.

Conclusion

While the impacts to soils would be similar to those described under Existing Management, the provision that the ERRP is designed for soil stability would help maintain long-term productivity. It would result in less irreversible, irretrievable commitment of soil resources than either Existing Management or Alternative A.

WATER RESOURCES

The impacts to water resources from oil and gas and geophysical operations are similar to those listed under Existing Management. The impacts from reclamation would be fewer from those listed under Alternative A because of the use of the ERRP. The total time for satisfactory reclamation using the ERRP is reduced and, therefore, the cumulative sediment yield and salinity are reduced.

Changes in livestock grazing under Alternative D would greatly benefit water resources. By reduced livestock use, vegetation density and infiltration rates would increase, erosion would be slowed and water quality and yield would improve. Under lower levels of livestock, high use areas (i.e., in riparian areas) would partially recover, thus giving the watersheds a natural way to trap sediment.

Impacts from wildlife and recreation would be similar to Existing Management and Alternative C, respectively.

Short-Term Use Vs. Long-Term Productivity

Erosion from oil and gas exploration roads and pads would introduce sediment into streams but with an active rehabilitation plan this would be short term.

Damage to riparian areas would be realized since very few restrictions would be placed on exploration in wetland or riparian zones.

Long-term adverse impacts could be realized to the groundwater as a result of oil and gas exploration wells and waste water injection. These are not expected to be significant.

Unavoidable Adverse Impacts

Erosion from oil and gas exploration roads and pads would be prevalent. Although a good reclamation plan may exist, any exploration in the wetlands or riparian zones could have adverse impacts to water quality and channel stability.

Irreversible and Irretrievable Commitment of Resources

Impacts to water quality and channel stability as a result of oil and gas exploration in the riparian areas could be irreversible and irretrievable if the channel was altered either directly or indirectly by such activity. The result would be the regrading of the channel with a sustained high sediment load.

Conclusion

Some additional restrictions and added reclamation requirements for oil and gas activities and lack of allocation of AUMs to livestock (from public lands) would result in a lower level of sedimentation than under any other alternative.

LIVESTOCK MANAGEMENT AND VEGETATION

The 162,000 Federally-authorized AUMs would be cancelled. This reduction would occur over the short term. However, due to the intermingled aspect of public and private lands, livestock grazing would continue to impact vegetation. Approximately 121,982 private and state lease AUMs would be present in the intermingled ownership area with livestock having access to public lands. Permits and leases presently held by livestock operators who do not own or control unfenced private or state land within the allotment boundary would be cancelled. Those permittees or lessees who do own or control unfenced lands within the allotment boundary would be offered exchange of use agreements for up to 121,982 AUMs. Under these agreements, stocking would be allowed only at the rate credited to the unfenced private or state lands. No management plans would be developed and

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those currently in force would be dropped.

Livestock operators wishing to maintain viable operations would have to reduce numbers, obtain additional grazing lands, or purchase more supplemental feed. Continuous grazing of preferred sites would result, but at a stocking rate low enough that ample forage would remain, and the resulting impact would be less than would occur under Existing Management. Weaning weights and productivity would increase but at such low stocking rates that the operation may no longer be economically feasible. Only those most preferred sites would receive heavy use by livestock, therefore, little trailing to and from water should be required. However, as animals scatter across allotments, additional supervision by livestock operators would be required to assure successful breeding.

This alternative would be highly beneficial for vegetation because of the limited amount of grazing by livestock. Plant communities (especially those on the more productive sites) would recover vigor and increase seed production, litter accumulation, and vegetation cover. Stable or improving trend in range condition would be expected over the long term. On some sites, it could take more than 50 years to show a significant improvement in range condition. On 51,085 acres of degraded lands, only stabilization of condition would be expected.

Sheep remaining in grazing allotments are herded and, to some extent, would be expected to be held on private land, particularly for lambing. Lambing impacts such as those described under Alternative A would be largely shifted to private lands.

Muddy area impacts to vegetation and livestock are the same as those described under Existing Management, except overall impact would be reduced under the lowered stocking rate.

The impacts from temporary disturbances would be the same as under Existing Management, except that reclamation would cause the same impacts as those described under Alternative A.

There would be no impacts from prescribed fire because it is not proposed under this alternative.

Short-Term Use Vs. Long-Term Productivity

Under this no grazing alternative, there would be no impacts to BLM-administered livestock

grazing from the surface disturbing programs. However, since limited grazing would be continued under exchange of use agreements, impacts similar to those identified under Existing Management could be expected. The scale of these impacts would be proportionately reduced by the 162,000 Federal AUMs that would remain unlicensed. The weed and pest control program, predator control program, stock trails, and wild horse removals would still provide long-term benefits similar to those listed under Existing Management.

Long-term productivity of the KRA to support the livestock industry would be greatly reduced under this alternative. Forage production would increase markedly for the remaining consumer species.

Unavoidable Adverse Impacts

Some short-term adverse impacts would occur during minerals exploration and development activities. These impacts would, however, be mitigated over the long term.

Irreversible and Irretrievable Commitment of Resources

A limited amount of vegetation would be lost due to minerals exploration and development. None would be lost due to installation of range improvements.

Conclusion

All Federal grazing permits and leases would be cancelled. The 162,000 active AUMs would no longer be authorized. Approximately 121,982 AUMs of use would be authorized under exchange of use agreements on the unfenced private and State lands within the allotments. Permits held by operators who do not own or control unfenced private lands within an allotment would be cancelled.

The net impact to the local livestock industry would be significantly destabilizing. The long-term impact to the forage resource, however, would be beneficial. Range condition would stabilize or improve on most sites due to reduced stocking levels.

FISH AND WILDLIFE HABITAT

The impacts to wildlife from geophysical exploration and oil and gas development would be the same as those described under the

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Existing Management alternative.

Adverse impacts from livestock grazing would be reduced. The removal of authorization for livestock on public lands (162,000 AUMs) would reduce grazing pressure to those AUMs authorized on private and other lands resulting in 60 percent reduction in stocking rate on public lands. Riparian areas currently in poor or fair condition (Appendix F) would show a marked improvement. Forage competition would be significantly reduced on big game winter ranges resulting in an increased carrying capacity, at least for the short-term. However, a lack of additional water developments would result in a lesser degree of beneficial impact to wildlife than Alternative C.

The impacts to wildlife from other programs would be similar to those described under Existing Management.

Short-Term Use Vs. Long-Term Productivity

Long-term productivity of the KRA for wildlife would increase due to the anticipated lower number of livestock and would decrease due to surface-disturbing activities. This would not be likely to affect wildlife numbers to a significant degree.

Unavoidable Adverse Impacts

Wildlife habitat would be lost due to surface-disturbing activities. The level of development, its location, and density in crucial winter range would determine the significance of the impacts.

Irreversible and Irretrievable Commitment of Resources

Some wildlife resources (habitat) would be committed for the life of the project and beyond. However, few surface-disturbing activities are expected to result in irreversible or irretrievable commitments of resources.

Conclusion

The reduction of livestock would be the predominant action affecting wildlife habitat. It could be expected to enhance long-term productivity of the KRA for wildlife. This would probably result in long-term increases in wildlife numbers above the Wyoming Game and Fish objective levels.

LAND RESOURCES

The impacts of retaining Star Valley lands in BLM ownership would be the same as described in Alternative C.

Approximately 2,500 acres in the rest of the KRA have range improvements that would need to be protected by patent reservations. These reservations would lower the fair market value of the land. Although there would be no licensing of federal AUMs, these reservations are necessary for private ranching to continue in a normal fashion.

The impacts to wildlife would be the same as described in Existing Management.

The Wasatch National Forest has requested that approximately 74,000 acres of BLM land south of Mountain View be transferred to the USFS. This transfer would eliminate the BLM's Meeks Cabin Forestry program. It would also remove a potential BLM recreation area. The oil and gas industry would be inconvenienced by having to deal with two agencies as the BLM would continue to manage the minerals and the USFS would manage the surface. The effect on range would be minimal if there was no licensing of federal AUMs. However, if the BLM did authorize AUMs, the Wasatch Forest's Range Management Plan might not be consistent with the BLM's. If transferring the land would necessitate conversions of livestock, it could be very costly to some ranchers. This transfer could be a convenience to the residents of Bridger Valley, as the office they would go to for various permits would be in Mountain View, rather than Kemmerer.

The impacts from seasonal and special stipulations on rights-of-way would be the same as those described in Existing Management, except the seasonal stipulation for lambing areas would be eliminated by a shift of lambing use to private lands.

The impacts associated with communication sites would be the same as those described in Existing Management.

The impacts from access acquisition would be the same as those described in Alternative A.

Short-Term Use Vs. Long-Term Productivity

Unavoidable Adverse Impacts, and Irreversible and Irretrievable Commitment of Resources would be similar to those described under

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Existing Management.

Conclusion

In general, the impacts would be similar to Existing Management except that lands would be transferred to the Forest Service. This is not expected to result in an immediate change in management.

CULTURAL RESOURCES

A reduction of livestock grazing on public lands would have a minimal beneficial effect to cultural resources. A lesser degree of erosion and soil disturbance to surface and subsurface components would be expected. Therefore, fewer cultural sites may be disturbed. In other respects, the impacts to cultural resources would be similar to Existing Management.

Short-Term Use Vs. Long-Term Productivity

Same as Existing Management.

Unavoidable Adverse Impacts

Same as Existing Management.

Irreversible and Irretrievable Commitment of Resources

Same as Existing Management.

Conclusion

Restrictions on oil and gas development and other surface disturbance would be similar to Existing Management. Overall, the loss of cultural resources would also be similar. Discovery of cultural resources during surface disturbance activities would be similar to Existing Management. However, there would be no discoveries made during brush control activities because none are proposed.

FORESTRY RESOURCES

The BLM land transfer to the Wasatch National Forest in the Meeks Cabin area would greatly reduce the timber base for the KRA. This would amount to about 6,600 acres of timber land. Such lands would not necessarily be removed from

the timber base because the Forest Service would be likely to continue managing the lands for the same purpose. The costs to logging operations, from the requirements for equipment crossings of perennial streams, would be similar to Existing Management. The revenue to the government from timber sales would also be similar to the revenue under Existing Management.

RECREATION

The anticipated increases in wildlife numbers would be likely to result in an increase in hunter use within the KRA. Other recreational activities, such as fishing and camping, are also likely to increase.

Conflicts between ORV users and livestock operators would be almost non-existent because no forage from public lands would be licensed to livestock operators and the KRA would be designated as "limited" for ORVs.

If the lands identified for transfer to the Wasatch National Forest are transferred, recreation and the recreation potential would be managed by the Forest Service.

Important values in the Raymond Mountain WSA would be maintained as in Alternative C.

The preparation of three RAMPs (as in Alternative C) would allow for a similar degree of protection for recreation resources.

Short-Term Use Vs. Long-Term Productivity

Same as Alternative C.

Unavoidable Adverse Impacts

Same as Alternative C.

Irreversible and Irretrievable Commitment of Resources

Same as Alternative C.

Conclusion

The impacts to recreation resources are expected to be similar to those described under Alternative C except that preparation of fewer RAMPs under this alternative may result in less consideration for recreation resources than would be possible with the information and

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analysis provided in the RAMPs. This could result in some loss of recreation potential beyond that identified in Alternative C. This alternative does provide good protection for recreation resources.

FIRE MANAGEMENT

Same as Alternative A.

SOCIOECONOMICS

Livestock - Of all the alternatives, this one would be the most economically and socially destabilizing to the local livestock industry. It is a modified "no grazing" plan that exercises exchange agreements between BLM and livestock operators to restrict livestock numbers to levels that can be supported by the 121,982 AUMs on private and State land in the "I" allotments.

Under this alternative, livestock operators who presently use Federal AUMs could be faced with a variety of economic and social impacts, depending upon the purpose that the Federal AUMs serve in their particular livestock management schemes. All livestock operators would have to reduce their herd sizes unless they could find substitute AUMs elsewhere. Some operators might be forced out of business if their ranches do not adjoin Federal land and their cattle cannot continue to take advantage of the lack of fences between ownerships, or if seasonal grazing that is equivalent to that provided by Federal lands could not be obtained elsewhere.

During the adjustment period, total average, annual ranch income would be declining by over \$118,000 per year and livestock sales by roughly \$263,000. Subsequently, total business activity would be decreasing an average of about \$542,000 annually. By the end of 10 years, total ranch income would have fallen over \$1 million below current levels and livestock sales by over \$2.6 million. Subsequently, annual ranch income and livestock sales would be expected to remain at these depressed levels for the remainder of the 50-year analysis period, or until the plan would change. Consequently, the depressed livestock sector could cause KRA business activity to remain depressed by \$5.4 million annually below current levels as long as the plan is in effect.

Recreation/Wildlife - Long-term productivity of wildlife would increase due to the lower livestock

numbers permitted under this alternative. This would result in increased hunter days and a related rise in recreational expenditures. However, the expected loss in average, annual livestock sales would be about \$6,000 more than the projected growth in recreation expenditures. Also, benefits accruing to total business activity from the rise in recreational expenditures would be more than offset by losses related to decreased livestock operations. Nevertheless, the recreation sector would benefit from a total of over \$1 million more sales in the first 10 years of the program, and would remain about \$1 million above current levels each year thereafter. This assumes that AUMs released by the livestock sector would be utilized by wildlife and that hunting days for big game, and related recreation expenditures, would rise to levels that utilize the increased supply of game.

Net Regional - This alternative results in an average, annual decline in net business activity in the KRA of over \$300,000 throughout the adjustment period. As long as the plan is in effect, business activity is expected to be \$3 million lower than current levels each year following the adjustment period.

Employment - Declines in employment in the livestock sector are not quite offset by increases in positions spawned by the recreation sector. Nevertheless, only about 3 positions are estimated to be lost in the KRA over the 50-year analysis period. However, there would be substantial dislocations for individuals losing jobs in the livestock sector because they may not be capable, or permitted, to relocate to jobs in the recreation sector. Also, businesses servicing each of these sectors may experience some measurable economic and personnel realignments.

Livestock Benefit/Cost Analysis - Because this alternative assumes that Federal AUMs will be withdrawn from licensing, it also assumes that current management and maintenance costs related to licensing would no longer exist. Such reduced management and maintenance costs are recorded in this analysis as benefits. So are positive effects to wildlife and recreation resulting mainly from reduced livestock numbers on Federal land.

This alternative realizes a net present value of \$3,318,418. Since there are no costs considered in the analysis, no benefit/cost ratio is calculated.

ALTERNATIVE E

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AIR QUALITY

Same as Existing Management except for the additional provision for dispersion analyses in H₂S areas. This would reduce the probability of toxic effects on humans from H₂S exposure. There would be additional short-term increases in smoke from prescribed burning on up to 82,610 acres.

Short-Term Use Vs. Long-Term Productivity

Same as Existing Management.

Unavoidable Adverse Impacts

Same as Existing Management.

Irreversible and Irretrievable Commitment of Resources

Same as Existing Management.

Conclusion

Same as Existing Management except that there would be additional protection for public health and safety in H₂S areas.

GEOLOGY AND MINERALS

The impacts to geophysical operations would be mixed, compared to Existing Management. Restrictions dealing with winter ranges for big game, roosting area buffer zones, nesting areas, and elk calving areas would be increased over Existing Management with impacts similar to Alternative C. Sage grouse and domestic sheep lambing area stipulations would be less restrictive than Existing Management, with less area and time delays involved. The impacts from hunting restrictions would be the same as Existing Management. The impacts from muddy area closures would be the same as Alternative B. For riparian areas, no surface disturbance would be allowed within 300 feet of live water, resulting in decreased surface area available for geophysical lines and interruptions on some lines. An added expense for some geophysical lines would result from the requirement for temporary bridges or portable operations in some stream crossing situations.

The impacts to oil and gas operations from lease stipulations would be the same as

Alternative C, as there would be delays and increased costs associated with “minimize access” areas.

The impacts from H₂S mitigation would be the same as Alternative B, as would impacts to well sites from landslide-prone areas.

Offsite mitigation requirements for crucial big game winter ranges and riparian areas would increase costs for oil and gas development over Existing Management. These costs would be less than under Alternative C because of the threshold (10 percent) provision, which requires offsite mitigation only when 10 percent of the habitat is disturbed.

“No surface occupancy” for oil and gas in areas around bald eagle roosting would cause increased costs compared to Existing Management, as would the requirement for “no surface occupancy” for 500 feet from riparian zones or live water (Existing Management deals only with live water). Directional drilling would be required more often.

Requirements to move well sites out of riparian areas, if possible, and to use bridges whenever possible to cross live streams would increase development costs over Existing Management.

Reclamation costs would increase over Existing Management due to requirements for topsoil inoculation, fertilizing, fencing, erosion control matting, and snow fences.

Stipulations on placer mining and gravel sales in riparian areas would be more restrictive than Existing Management, but less so than Alternative C.

Short-Term Use Vs. Long-Term Productivity

Short-term use of oil and gas drilling would be reduced compared to Existing Management. Neither short-term use nor long-term productivity would be affected as much as under Alternative C.

Unavoidable Adverse Impacts

Impacts would be reduced from Existing Management but not as much as Alternative C.

Irreversible and Irretrievable Commitment of Resources

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Same as Existing Management.

Conclusion

As with Alternative C, oil and gas exploration and development may be reduced within the KRA because operators may move to areas where restrictions on development are more lenient. Oil and gas production in the region as a whole would not be expected to change.

SOILS

Geophysical exploration restrictions including seasonal stipulations regarding wet conditions, no surface disturbance within riparian zones and minimal stream crossings would provide long-term beneficial impacts as in Alternative C. Lease stipulations on slopes in excess of 25 percent, “no surface occupancy” in riparian zones and avoidance of high landslide potential areas would reduce impacts of soil loss due to construction of road networks and well fields.

Projected reclamation success on temporary disturbances would be high under this alternative due to additional benefiting practices; improved seedling establishment through drill seeding and nutrient recycling through biomass return. Reclamation success on drill pads would be better than under existing management.

Livestock grazing impacts to soils would reflect consequences associated with Alternative B, with a decrease in erosion and instability of streambanks due to utilization levels of 60 percent on riparian zones. Streambank erosion and loss of vegetative cover accompanying placer mining and logging would decrease due to limitation of disturbance and use of streambank retainers, bridges and culverts.

ORV use would continue to produce minimal impacts through protection associated with “limited” designation and closures. Watershed protection through ACECs and HMPs would provide long-term improvement in watershed stability.

Avoiding road construction in critical erosion areas and high landslide potential areas would decrease the potential for long-term soil loss.

Short-Term Use Vs. Long-Term Productivity

Short-term use involved with geophysical exploration is not projected to have a significant

impact to long-term soil productivity due to avoidance of activity during wet conditions, reclamation supporting stabilization, and use of existing stream crossings or temporary bridges. Movement of proposed drill sites and related roads away from high landslide potential areas would decrease potential for soil productivity loss due to mass wasting. Disturbance restrictions on slopes greater than 25 percent would promote successful reclamation, stabilization, and protection of long-term soil productivity.

The inoculation of topsoil, fertilization, and fencing of disturbances would maintain or improve long-term soil productivity and stability. Any implementation of AMPs over the short term would increase long-term soil productivity through distribution of compaction potential and protection of ground cover.

Short-term soil loss due to vegetation manipulation (82,610 acres) and construction of range improvements would result in long-term increases in soil productivity as in Existing Management.

Protection of riparian zones through decreases in utilization would promote ground cover and increased long-term soil productivity.

Losses in soil productivity can be projected from logging and mining activities mainly due to the avoidance of riparian zones and the use of bridges in road construction. These impacts are not expected to be significant.

Use of fencing and access blockage along rights-of-way would protect reclamation efforts and maintain soil productivity through avoidance of vehicular compaction.

Unavoidable Adverse Impacts

Unavoidable soil loss is expected to be greatest in oil and gas development disturbances before reclamation is successful. Under this alternative, the time before stabilization is minimized through stipulating four-year reclamation timeframes.

Irreversible and Irretrievable Commitment of Resources

Irretrievable soil loss would continue due to developmental disturbance, however, levels of soil loss would be minimized due to a four-year reclamation timeframe, and interseeding of soil stabilization species in the reclamation prescription.

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Irreversible soil loss and diminished productivity associated with landslides would be minimized through avoidance of high landslide potential areas.

Conclusion

This alternative would result in minimal impacts to soils from geophysical exploration, ORV use, mining, and logging operations, primarily due to restrictions on time and place of disturbance. Reclamation success can be expected to be greatest under this alternative due to improved practices, stabilization requirements, and avoidance of unreclaimable situations. Long-term watershed improvement can be expected from AMP, ACEC, and HMP implementation.

WATER RESOURCES

Restrictions to both geophysical and oil and gas exploration would enhance water quality and sustained yield. Restrictions like no surface disturbance within 300 feet of live water for geophysical, and “no surface occupancy” within 500 feet of live water for oil and gas exploration would especially help to protect the riparian areas which are so critical to maintaining the water quality. Reclamation efforts also would help reduce impacts to the water resources as soil stability would be quickly achieved. This would, in turn, reduce sediment and salt loads to both the Bear and more importantly the Green River Basins.

Actions proposed under livestock management would, on an overall basis, improve the watershed. Implementing AMPs on 23 “I” allotments and grazing riparian zones at only 60 percent utilization would increase the cover factor, reduce channel bank sloughing, and reduce downstream sedimentation levels. ORV pressures would be reduced which would also minimize erosion due to “limited use” designation. Requiring “no exception” seasonal stipulations on rights-of-way and avoidance on landslide areas would eliminate potential water related problems.

Short-Term Use Vs. Long-Term Productivity

Erosion emanating from oil and gas exploration roads would occur but, because of buffer strips and rehabilitation, it should be short term.

Channel degradation, as a result of livestock grazing, would be reduced because of the restrictions on use of riparian areas.

Long-term groundwater impacts would be possible from drilling activities. They are not expected to be significant. **Unavoidable Adverse Impacts**

There would be erosion from oil and gas roads but, with proper planning and placement, the impacts to the water resource should be reduced.

Some streambank damage may occur as a result of livestock grazing but, with the restrictions and proper allotment planning, this could be reduced.

Irreversible and Irretrievable Commitment of Resources

Groundwater would be the only water resource which could be permanently impacted.

Conclusion

Most actions, causing adverse impacts to water resources, could probably be offset with a mitigation measure which would be compatible with most resources.

LIVESTOCK MANAGEMENT AND VEGETATION

There are currently 162,000 AUMs authorized for livestock. An additional 31,901 AUMs of forage production are expected to become available. This projection of forage production is dependent upon implementation of 18 new AMPs with accompanying grazing systems and range improvements as well as continuation of five existing AMPs.

Rangeland monitoring studies would estimate the amount of available forage. Allotment specific objectives would determine the proportion of the increase that would be allocated to livestock, to wildlife, and to watershed.

The requirement for management of riparian areas prior to allowing conversion from sheep to cattle would reduce adverse impacts below those under Alternative B. This requirement may, however, adversely affect some permittees who are low on the list of “I” allotments or who are on “M” or “C” allotments since their applications for conversion may not be dealt with for several

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years.

Adverse impacts to riparian areas in "I" category allotments would be reduced because these areas would receive the most intensive management. Impacts from this level of management would be mostly beneficial to the forage resource. Some adverse impacts in terms of increased labor or financial contribution would be experienced by livestock operators. This impact would be mitigated by future increases in productivity.

Approximately 646 AUMs on non-allotted public lands would be made available for licensing under this alternative.

Only those portions of lambing areas actually being used would be closed to seismic activity. Other impacts from geophysical exploration and development would be similar to those described under Alternative B. Temporarily disturbed areas such as roads, pipelines, and abandoned oil and gas wells would be reclaimed on a site specific basis. Livestock would be benefitted over the long-term by restoration of short-term forage losses due to construction activities. As a result of more intensive reclamation requirements, vegetation condition would improve over the long term on these sites.

Harassment of livestock through ORV use would be reduced by the "limited" ORV designation.

The impacts from fire management would be the same as those discussed under Alternative A.

Short-Term Use Vs. Long-Term Productivity

The effect on long-term productivity would be similar to Alternative A except for the anticipated increased benefits from intensive management of riparian areas on "I" category allotments. In addition, stricter reclamation stipulations would result in greater success of these efforts, thereby allowing a greater and more rapid improvement of range condition on these sites.

Unavoidable Adverse Impacts

Same as Alternative B.

Irreversible and Irretrievable Commitment of Resources

Same as Alternative B.

Conclusion

A long-term increase of 31,901 AUMs would be expected. This increase would be proportioned to livestock, wildlife, and watershed to meet specific allotment level objectives in accordance with 43 CFR 4130. Trend in range condition on "I" allotments would be expected to stabilize or improve. Trend in range condition on "M" or "C" category allotments would, at least, be expected to stabilize. Management of riparian areas on "I" category allotments would be the most intensive under this alternative.

FISH AND WILDLIFE HABITAT

The impacts to big game winter ranges, elk calving areas and sage grouse strutting grounds from geophysical exploration would be the same as under Alternative C. Disturbance would occur to raptor nesting areas during early mating and fledging periods; however, the most sensitive parts of the nesting cycle would be protected from disturbance resulting in no nest abandonment or loss of productivity. The impacts to riparian areas would occur in some areas with fragile soil. However, impacts would be less than those occurring under Existing Management.

Conclusion

Long-term productivity of wildlife in the KRA would be maintained or improved. Conflicting activities would be allowed and regulated by both required and case-by-case imposed stipulations. Case-by-case stipulations would be designed to enable development activities to take place, while at the same time avoiding irreversible, irretrievable impacts to wildlife.

LAND RESOURCES

The impacts from land disposal actions would be the same as those described in Existing Management.

The impacts from special and seasonal stipulations and avoidance areas would be the same as those described in Alternative C.

Communication site impacts would be the same as those in Alternative A.

Access acquisition impacts would be as described in Alternative A.

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Short-Term Use Vs. Long-Term Productivity

Same as Alternative C.

Unavoidable Adverse Impacts

Lands sold would be lost to multiple use management.

All adverse impacts should be mitigated through proposed management stipulations.

Irreversible and Irretrievable Commitment of Resources

Land disposal would be irretrievably lost to public management.

Conclusion

The impacts to wildlife from oil and gas development would be less than under Existing Management, but greater than under Alternative C. The Woodruff Narrows and Morgan Canyon bald eagle roosts would be protected from development by a “no surface occupancy” stipulation for public lands. The impacts to crucial big game winter ranges would be partially mitigated by habitat improvement projects designed to increase productivity within a herd unit impacted by development and by the addition of wildlife conditions to APDs in the most important parts of the crucial winter range. The impacts to riparian areas would be similar to those described under Alternative C. Direct habitat loss would be minimized in most cases by a 500-foot “no surface occupancy” stipulation; however, damage to riparian systems from increased erosion and lowered water quality would likely impact fisheries values in sensitive areas, such as the Thomas Fork drainage.

Adverse impacts from inadequate reclamation practices would be reduced from those identified under Existing Management. Improved soil stabilization on drill pads and rights-of-way, and the use of brush-beaters whenever possible on pipelines would benefit wildlife habitat by reducing the time spent before forage and cover returned.

The impacts from livestock grazing would be similar to Alternative A, except as follows. Conversion from sheep to cattle would be restricted in riparian areas to prevent a decline in condition. Before any conversions were

allowed, a management plan would be completed showing how riparian areas would be managed in such a way to avoid causing adverse impacts. Utilization levels of key riparian grasses would be set at 60 percent in “I” allotments. This would still allow the use specific grazing systems which deferred or rested pastures during some periods and grazed at over 60 percent during others. This level of grazing is considered the maximum allowable to maintain riparian systems in fair condition without a declining trend.

Impacts from ORV use, land disposals, and right-of-way management would be similar to those described under Alternative C.

Long-term productivity would be maintained under this alternative because of protective stipulations placed on rights-of-way. These stipulations would also help reduce unavoidable adverse impacts.

CULTURAL RESOURCES

Closing roads to seismic vehicle passage when roads are wet would benefit the historic trail system. Lesser degrees of trail impact would be expected. Other surface and near surface cultural values would also receive a beneficial impact as there would be less surface disturbance.

Not allowing new surface disturbance near perennial streams would have a beneficial impact to cultural resources, especially prehistoric sites. Terraces above perennial streams and dependable seasonal water sources have high potential of buried cultural resources. Avoidance of such areas by surface disturbing activities is beneficial to the cultural resources located near such areas.

The road closures proposed for Dempsey Ridge would have a beneficial impact on cultural resources. Less visitor use of the area would result in less disturbance to the historic trail system, less vandalism, and less illegal artifact collection.

Short-Term Use Vs. Long-Term Productivity

Short-term land use would be more favorable to cultural resources under this alternative in that a number of land use decisions proposed enhance the protection of cultural resources.

Unavoidable Adverse Impacts

ENVIRONMENTAL CONSEQUENCES

Unavoidable adverse impacts would be minimized. Historic trails would suffer less impact and certain high site potential areas (creek terraces, riparian zones, etc.) would enjoy greater protection.

Irreversible and Irretrievable Commitment of Resources

Fewer irreversible or irretrievable commitments would occur to cultural resources. Those that do arise would be managed according to Existing Management.

Conclusion

Unavoidable damage or loss of cultural resources would be lowest under this alternative except for Alternative C.

FORESTRY RESOURCES

The costs to logging operations, from the requirement for equipment crossings on perennial drainages, would be similar to Existing Management. The revenue to the government from timber sales would also be similar to Existing Management.

RECREATION

The impacts to hunting would be the same to those identified under Existing Management.

Other impacts would be similar to those identified under Alternative C except that more of the KRA would remain open to snowmobile use (i.e., Rock Creek elk winter range) and the closure in the Slate Creek elk winter range would be evaluated annually. These changes are not expected to result in impacts substantially different than under Alternative C.

FIRE MANAGEMENT

Same as Alternative A.

SOCIOECONOMICS

Given the assumption that changes in livestock AUMs and recreation days in Alternative E are the same as Alternative A, the socioeconomic analysis for Alternative E is the same as presented earlier for Alternative A.

CHAPTER V

CONSULTATION AND COORDINATION

INTRODUCTION

The Kemmerer Resource Area resource management plan (RMP) was prepared by an interdisciplinary team of resource specialists from the resource area, the Rock Springs District Office, and the Wyoming State Office. Consultation and coordination with agencies, organizations, industry, and key individuals has occurred in a variety of ways throughout the RMP planning process. Public meetings, informal meetings, individual contacts, letters, and Federal Register notices have been utilized to involve the public in the preparation of this document. Writing of the RMP began in the winter of 1983/84.

PUBLIC PARTICIPATION

A Federal Register notice was published on October 7, 1981, to announce that the KRA was going to prepare a resource management plan; eight responses were received. All eight were placed on the mailing list.

In April of 1982, the State Director's office mailed out letters regarding the status of the plan; 27 responses were received by the KRA. All 27 inquiries were answered with a letter, a map identifying analysis units, a list of possible issues, and a summary sheet of the nine planning actions involved in the preparation of an RMP.

A second mailing of 291 letters was sent on November 25, 1983. These letters informed the following groups of the proposed issues and the criteria to be used: resource area grazing permittees, industry, conservation groups, consultants, local, state and Federal governments, and other interested citizens. The letter also was an invitation to attend a public meeting on December 8, 1983, to discuss the issues and criteria.

The public meeting was held as scheduled with 15 individuals attending; ten from industry, two from the local historical society, two from the Federal government (one Park Service and one Forest Service), and one rancher. The issues and planning criteria were approved on January 23, 1984.

Other informal coordination with the public took place throughout the planning process by means of personal contacts, formal and informal professional meetings, telephone calls, etc.

CONSISTENCY

Coordination with other agencies was accomplished through continuous communications and cooperative efforts between the BLM and involved Federal, state and local agencies, and organizations.

The Wyoming Governor's Clearinghouse was supplied with copies of this draft document for review to ensure consistency with the State's plans, policies, and programs. Letters were sent to all affected counties and municipalities requesting a copy of their land use plans to review for consistency. A meeting with the Lincoln County Planner was held on January 24, 1984. Letters were also sent to the County Commissioners of Lincoln, Uinta, and Sweetwater counties. The towns of Opal, Diamondville, and Kemmerer sent copies of their land use plans for the resource area to review for consistency.

The Rock Springs District Multiple Use Advisory Council and the district Grazing Advisory Board were consulted to determine their concerns regarding the RMP.

Plans for the Bridger-Teton and Wasatch-Cache National Forests and Fossil Butte National Monument have been reviewed and supervisors and superintendents have been consulted.

AGENCIES AND ORGANIZATIONS CONSULTED

The RMP team has consulted with and/or has received input from numerous organizations during the development of the RMP. These include the following:

Federal Agencies

CONSULTATION AND COORDINATION

Bureau of Indian Affairs
Bureau of Reclamation
National Park Service
Soil Conservation Service
U.S. Congressman Dick Cheney
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Geological Survey
U.S. Senators Alan Simpson and Malcolm Wallop

State of Wyoming

Game and Fish Department
Geological Survey of Wyoming
Governor of Wyoming
Lincoln County Representative Alan Stauffer
Oil and Gas Conservation Commission
Public Service Commission
State Highway Department
State Land Use Planning Chairman
State Planning Coordinator
State Planning Engineer
University of Wyoming - Weather Department
Western Wyoming College
Wyoming Land Office
Wyoming Recreation Commission

Local Government

County Commissioners of Lincoln, Uinta, Sweetwater counties
Towns of Evanston, Kemmerer, Frontier, Opa!, Fort Bridger, Granger, Lyman, Mountain View
Lincoln County Planning Office
Mayors of Cokeville, Kemmerer
Uinta County Planner
County Libraries of Lincoln and Uinta
Diamondville Town Planner

Industry

Amoco Production Company
Ark Land Company
Atlantic Richfield Company
Bronco Exploration
Champlin Petroleum Company
Chevron U.S.A.
Coastal State Energy Company
Conoco
Consolidation Coal Company
Consolidated Georex Geophysics
Daniel Geophysical, Inc.
Delta Aerial Surveys, Inc.
Enertec Geophysical Services Ltd.
Exxon
Fortune Oil Company
Geophysical Service Inc.
Grant Geophysical

HR Exploration Company
Idaho Power Company
International Association of Geophysical Contractors
Kiewit Mining and Engineering Company
Marathon Oil Company
Meridian Land and Mineral Company
Morrison-Knudsen Company, Inc.
North American Coal Corporation
Northern Geophysical of America
Northwest Pipeline Corporation
Northwestern Resources Company
Overthrust Industrial Association
P & M Coal Company
Peabody Development Company
Petroleum Association of Wyoming
Petroleum Institute
Petty Ray Geophysical Division
Phillips 66
Rocky Mountain Energy
Rocky Mountain Geophysical
Rocky Mountain Oil and Gas Association, Inc.
Santa Fe Industries, Inc.
Shell Oil
Sohio Petroleum Company
Standard Oil Company
True Oil Company
Uinta Development Company
United States Steel Corporation
Upland Industries Corporation
Utah International Inc.
Utah Power and Light Company
Western Energy Company
Wexpro Company

Consultants

Antaeus: Resources Consulting
Attorney Edward M. Bown
Attorneys Lonabaugh and Riggs
BRW, Inc.
Center for Urban Affairs and Policy Research
(Northwestern University)
Leedshill Consulting Engineers
Dick Loper
MSM Consultants Inc.
Willard Owens Associates
Wyoming Natural Heritage Program

Conservation Groups

The Nature Conservancy
Overthrust Wildlife Association
Sierra Club
The Wilderness Society

Others

Many individuals were contacted including all range permittees and lessees in the KRA.

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GLOSSARY

ACEC. Area of critical environmental concern.

ADIT. An almost horizontal entrance to a mine.

AD VALOREM. Levied according to assessed value.

AIR BASINS. These are the areas in which weak dispersion conditions result from the effects of obstructions on the normal wind flow pattern. These obstructions are elevated topographic features, such as mountain ranges or canyon walls.

ALLOTMENT. An area designated and managed for the grazing of livestock.

AMBIENT AIR QUALITY. The state of the atmosphere at ground-level as defined by the range of measured and/or predicted ambient concentrations of all significant pollutants for all averaging periods of interest.

AMBIENT STANDARDS. The absolute maximum level of a pollutant allowed to protect either public health (primary) or welfare (secondary).

AMP. Allotment management plan.

APD. Application for a permit to drill. An application by an oil and gas leaseholder to drill a hole to explore for oil and gas resources.

AQUIFER. A geological formation containing water.

ATMOSPHERIC DISPERSION MODEL. A mathematical simulation of the atmospheric transport and dispersion of pollutants used to predict pollutant concentrations.

ATM. Atmosphere.

AUM. Animal unit month. The amount of forage required to support one cow and one calf for one month (800 lbs.); also one month's forage for one horse, one elk, one moose, five deer, or about 15 antelope.

BACKGROUND CONCENTRATION. The existing levels of air pollutant concentration in a given region. In general, it includes natural and existing emission sources, but not future emission sources.

CFS. Cubic feet per second. A measure of flow of a fluid.

CLASS I AREAS. Specified areas (generally comprising National Parks and Wilderness) where deterioration of air quality is severely limited.

CLASS II AREAS. Specified areas (comprising most areas currently attaining air quality standards) where moderate deterioration of quality is allowed.

CORRIDOR. A strip of land, usually a few to many times the width of a right-of-way through which one or more facilities (e.g. pipelines, roads, powerlines) may be located.

DISPERSION. The spreading out of pollutants. Generally, used to show how much an air pollutant will spread from a particular point.

DISPERSION POTENTIAL. The ability of the atmosphere to dilute or disperse air pollutants, as determined by normal ventilation values. A high dispersion potential results from high ventilation values, which can be caused by high transport wind speeds, high mixing heights, or high values of both.

ECOLOGICAL RANGE CONDITION. Range condition is the present state of vegetation on a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community for the site. Range condition is basically an ecological rating of the plant community. Air-dry weight is the unit of measure used in comparing the composition and production of the present plant community with that of

the climax community.

EFFECTIVE PRECIPITATION. That portion of the total precipitation which becomes available for plant growth.

EIS. Environmental impact statement. A document required by NEPA which describes the environmental impacts of "major Federal actions having significant impacts to the quality of the human environment."

EMISSION FACTOR. An empirically derived mathematical relationship between pollutant emission rate and some characteristic of the source such as volume, area, mass, or process output.

EROSION. The wearing away of a land surface due to the action of running water, wind, ice, or other geologic agents.

EROSION CONDITION. Describes present and past erosion as it occurs on the landscape.

ERRP. Erosion control revegetation and restoration plan. A surface use plan for surface disturbing activities.

FLPMA. Federal Land Policy and Management Act of 1976 (P.L. 94-579). Sometimes termed the Bureau's organic act. Started the requirement for resource management plans (RMPs).

GEOMORPHIC. Pertaining to the form of the earth or its surface features.

GPM. Gallons per minute.

GROUNDWATER. Water contained in the pore spaces of consolidated and unconsolidated surface material.

HMP. Habitat management plan. Activity plan prepared for wildlife habitat management.

INCREMENT. Incremental standards (prevention of significant deterioration) are the maximum amounts of pollutants allowed above the baseline in regions of clean air.

INFILTRATION. The downward entry of water into the soils.

KGS. Known geologic structure.

KIND OF LIVESTOCK. Refers to type, such as cattle, sheep, horses, etc.

KRA. Kemmerer Resource Area.

KSLA. Known sodium leasing area.

LEACHING. The removal or movement of materials in solution within the soil.

LEASABLE MINERALS. Minerals subject to lease by the Federal government including oil, gas, coal, and trona.

LOCATABLE MINERALS. Generally the metallic minerals subject to development specified in the Mining Law of 1872.

MFP. Management framework plan.

Mg/M³. Milligrams per cubic meter.

MODELING. A mathematical or physical representation of an observable situation. In air pollution control, models afford the ability to predict pollutant distribution or dispersion from identified sources for specified weather conditions.

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS). A set of EPA standards regulating the maximum allowable concentrations of air pollutants permitted in the United States. Primary standards protect the public health; secondary standards protect the public welfare. Standards are in force for SO₂, TSP, NO₂, O₃, CO, and lead.

NEPA. National Environmental Policy Act of 1969. Sets national environmental policy and began the requirement for environmental impact statements.

GLOSSARY

- NONATTAINMENT AREA.** An area in which one or more NAAQS/WAAQS is being violated.
- NON PROGRESSIVE SURVEY.** Soil Conservation Service term depicting an area with no current soil survey publication or plans to survey soils except on a request basis.
- NORA.** Notice of realty action.
- NRHP.** National Register of Historic Places.
- NSO.** No surface occupancy. A restriction placed on oil and gas operations.
- ORV.** Off-road vehicle. Any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain.
- ORV DESIGNATIONS.** "Open areas" - designated areas where off-road vehicles may be operated subject to the operating regulations and vehicle standards.
- "Closed areas" - designated areas where the use of off-road vehicles is permanently or temporarily prohibited.
- "Limited areas" - designated areas where the use of off-road vehicles is subject to restrictions deemed appropriate by the authorized officer. Restrictions may limit the number or types of vehicles allowed, dates and times of use, and similar matters. Limited areas may be designated for special or intensive use.
- PARENT MATERIALS.** Unconsolidated material formed from bedrock which undergoes further changes to form soil.
- pH.** The acidity of a solution measured on a scale of 0 to 14, with 7 representing neutrality. Values less than 7 indicate acidity; values greater than 7 represent alkalinity. This value is calculated by taking the negative logarithm (base 10) of the effective hydrogen ion concentration measured in equivalents per liter.
- PLANT COMMUNITY.** An association of plants occupying a site under a specific set of environmental conditions.
- PPM.** Parts per million.
- PREVAILING WIND.** The most frequent compass direction from which the wind blows.
- PSD INCREMENTS.** The maximum allowable increase in pollutant concentrations permitted over baseline conditions as specified in the EPA Prevention of Significant Deterioration (PSD) regulations (40 CFR Part 52.21). The regulations apply only to areas currently attaining NAAQS/WAAQS. Most National Parks and Wilderness areas are Class I Areas, where almost no future pollution increase is permitted. Most other areas are Class II Areas, where a moderate increase in pollution levels is allowed.
- R&PP.** Recreation and Public Purposes act. Lease applications or patent requests which would grant State or local government entities or non-profit associations the right to use public lands for recreation or public purposes. Some examples are parks, schools, sanitary landfills, and wildlife feedgrounds.
- RAMP.** Recreation area management plan.
- RANGE SITE.** A distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. A range site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differs from that of other range sites in the kind or proportion of species or in total production.
- RIPARIAN AREA.** A specialized form of wetland with characteristic vegetation restricted to areas along, adjacent to, or contiguous with rivers and streams.
- RMP.** Resource management plan. A comprehensive land use plan prepared by BLM to guide future management of lands and resources in a resource area (as required by the Federal Land Policy and Management Act of 1976 - FLPMA).
- ROS.** Recreation opportunity spectrum. Includes the following classifications: Primitive (P); Semi-Primitive, Non-Motorized (SPNM); Semi-Primitive, Motorized (SPM); Roaded Natural (RN); Rural (R); and Urban (U).
- RUNOFF.** Water that flows on the land surface from an area in response to rainfall or snowmelt.
- SALINE-ALKALI SOIL.** A soil containing sufficient exchangeable sodium to interfere with the growth of most plants and containing appreciable quantities of soluble salts.
- SALINITY.** A measure of the amount of mineral substances dissolved in water.
- SCS.** Soil Conservation Service.
- SEISMIC.** Of, subject to, or caused by an earthquake or an earth vibration produced artificially.
- SMCRA.** Surface Mining Control and Reclamation Act of 1977.
- SOIL EROSION HAZARD.** The susceptibility inherent in the soil itself to erode if the forces that cause erosion are applied to an area that is not adequately protected. It describes the possibility of future erosion. Factors influencing erosion hazard include vegetative cover, slope gradient, rainfall, and wind intensity.
- STABILITY CLASS.** A simple method for representing the ability of the atmosphere to resist vertical motion and thus mixing of pollutants. Often represented by "A" through "F" designations with "A" representing high mixing and "F" representing extremely stable conditions.
- SWEETENING.** The removal of hydrogen sulfide (H₂S) from natural gas.
- TOTAL SUSPENDED PARTICULATES (TSP).** The portion of the total particulate matter in the atmosphere consisting of particles so small that the particles settle out very slowly.
- TRANSPORT WIND.** The average horizontal wind speed component perpendicular to a vertical cross section of the atmosphere. In this report, the vertical limits are defined by the ground and the mixing height.
- TRONA.** A naturally occurring sodium sesquicarbonate formed in ancient saline lakes. Generally honey or light brown in color, depending on the impurities present. Major natural source of soda ash.
- TUP.** Temporary use permit.
- USFS.** United States Forest Service
- VEGETATION TYPE.** A plant community with visually distinguishable characteristics, named for the apparent dominant species.
- VISIBILITY.** A measurement of the maximum distance to which large objects may be viewed. Fixed reference objects such as mountains, hills, towers, or buildings are normally used to estimate visibility.
- VISUAL RANGE.** The distance at which a black object (in practice, a distant mountain) becomes indistinguishable to an observer.
- VRM.** Visual resource management. The planning, designing, and implementation of management objectives to provide acceptable levels of visual impacts for all BLM activities.
- WATER BAR.** A ridge made across a hill to divert water to one side.
- WATERSHED.** All lands which are enclosed by a continuous

GLOSSARY

hydrologic drainage and lie upslope from a specified point on a stream.

WDEQ. Wyoming Department of Environmental Quality.

WIND ROSE. Any one of a class of diagrams designed to illustrate the distribution of wind direction experienced at a given location over a given period of time. Wind roses may also give information concerning distribution of wind speed, stability, or other meteorological parameters.

WITHDRAWAL. Withholding of an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities

under those laws in order to maintain other public values in the area or reserving jurisdiction over an area of Federal land, other than "property" governed by the Federal Property and Administrative Services Act, as amended (40 U.S.C. 472) "from one department, bureau or agency to another department, bureau, or agency." FLPMA 43 U.S.C. 1702.

WSA. Wilderness study area.

WYOMING AMBIENT AIR QUALITY STANDARDS (WAAQS). Analogous to the NAAQS, except established by the Wyoming Department of Environmental Quality to regulate pollutant concentrations in Wyoming.

KEMMERER RMP/EIS TEAM
List of Preparers

Name	Responsibility	Qualifications
Ron Wenker	Area Manager, overall responsibility	B.S. Range Management, 11 years BLM
Don Dutcher	Team Leader through identification of issues and planning criteria	B.A. Liberal Arts, M.A. Public Administration, 8 years HUD, 4 years BLM
Alan Stein	Team Leader from alternative formulation through draft EIS	B.S. Biology, M.S. Biology, 2 years EPA, 9 years BLM
Russ Storbo	Assistant Team Leader, Recreation, Wilderness	B.S. Park Administration, 2 years NPS, 6 years BLM
Dave McInay	Lands	B.S. Forest and Range Management, 8 years BLM
Roland Robbins	Forestry	B.S. Forestry-Watershed, 15 years BLM
Bruce Baker	Wildlife Biology	B.S. Biology, M.S. Wildlife Management, Ph.D. Wildlife Ecology, 5 years BLM
Chester Novak	Soils	B.S. Forestry/Forest Soil Management, 5 years BLM
Steve Cooke	Hydrology	B.S. Watershed Science, 3 years BLM
Gary McNaughton	Geology	B.S. Geology, 7 years BLM
Dave Henderson	Range, Vegetation	B.S. Forestry/Wildlife Management, M.S. Range/Wildlife Habitat Management, 5 years BLM
Pat Netherly	Range, Vegetation	B.S. Forest Management, 4 years BLM
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John Young	Socioeconomic Conditions	B.S. Animal Science, M.S. Agricultural Systems, 3 years BLM
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Judy Jezard	Secretary	1 year BLM, 6 years private industry

APPENDIX A-1

STANDARD OPERATING PROCEDURES FOR RANGE IMPROVEMENTS AND VEGETATION MANIPULATIONS

The following procedures would apply to the construction of all management facilities and vegetation manipulations:

1. Specific projects would be assessed individually through environmental assessments to determine the environmental impacts.
2. Roads or trails to new construction or project sites would not be constructed if existing roads and/or trails could be used.
3. All areas of proposed surface disturbance due to construction of range developments would be inventoried for archaeological features. All archaeological sites identified by the inventory would be avoided or mitigated.

If undiscovered cultural remains are encountered during construction, the operator would temporarily discontinue construction until BLM evaluates the discovery and determines the appropriate action.

4. No action would be taken by BLM that could jeopardize the continued existence of any federally listed threatened or endangered plant or animal species.

BLM would also comply with any state laws applying to animal or plant species identified by the state as being threatened or endangered (in addition to the federally listed species).

5. Wildlife escape devices would be installed and maintained in all water troughs.
6. After construction, any disturbed areas would be revegetated by natural or artificial means.

7. An analysis of cost effectiveness would be completed on an allotment management plan basis prior to the installation of any management facilities or land treatments.
8. All areas where vegetation manipulations occur would be totally rested from livestock grazing for a period necessary to allow for the recovery and re-establishment of key forage species. The minimum requirement would be one growing seasons' rest.
9. Vegetation manipulation projects would be designed in irregular patterns creating more "edge", with islands of vegetation left intact for cover.
10. Consultation with the affected interest groups and an approved environmental analysis would be required before any vegetation manipulation project is initiated.
11. Chemical treatment would consist of applying approved chemicals to control noxious or poisonous plants. Before chemicals are applied, the BLM would comply with the Department of Interior regulations. All chemical applications would be preceded by an approved pesticide use proposal. All applications of pesticides would be under the supervision of a licensed pesticide applicator. All applications would be carried out in compliance with the pesticide laws for Wyoming.
12. All land treatment projects on crucial wildlife ranges will be limited in size, where necessary, by the cover requirements of wildlife. Proper mitigation measures would be incorporated.

APPENDIX A-2

LIVESTOCK GRAZING BY ALTERNATIVE

"1" ALLOTMENTS

Alotment Number	Alotment Name	Existing Livestock AUMs 1/	Alternatives 2/	Develop and Implement AMP	Change in Livestock Forage AUMs 3/	Acreage of Vegetation Manipulation	No. of Reservoirs	No. of Wells	No. of Springs	Miles of Fence	Cattleguards	Miles of Pipeline	Type of Management System 4/
1005	Smiths Fork	26,029	EM A B C D E	No Yes Yes Yes No Yes	0 + 3,609 + 4,609 - 2,134 - 18,945 + 3,609	0 5,000 10,000 0 0 5,000	0 0 2 0 0 0	0 0 0 0 0 0	0 5 15 5 0 5	6 15 30 6 0 15	0 3 6 0 3 0	0 0 0 0 0 0	None GS GS GS None GS
1206	Cumberland/Uinta	66,690	EM A B C D E	No Yes Yes Yes No Yes	0 +15,690 +19,690 - 5,794 -38,570 +15,690	0 45,000 65,000 30,000 0 45,000	0 15 30 1 0 15	0 0 0 1 0 0	0 10 20 0 0 10	0 30 50 30 0 30	0 6 10 6 0 6	0 6 12 0 0 6	None GS GS GS None GS
1113	Slate Creek	12,293	EM A B C D E	No Yes Yes Yes No Yes	0 + 2,229 + 3,229 - 2,395 -10,780 + 2,229	0 5,000 10,000 0 0 5,000	0 40 75 0 0 40	0 0 0 0 0 0	0 0 0 0 0 6	0 12 15 0 0 12	0 2 3 0 0 2	0 0 0 0 0 6	None GS GS GS None GS
1035	Rock Creek	13,267	EM A B	Follow existing AMP Evaluate existing AMP Follow existing AMP	0 + 3,325 + 4,325	10,000 15,000	8 10	0 3	6 6 6	6 6 6	6 6 8	6 6 6	GS GS GS

Allotment Number	Allotment Name	Existing Livestock AUMs1/2/	Alternatives	Develop and Implement AMP	Change in Livestock Forage AUMs3/	Acres of Vegetation Manipulation	No. of Reservoirs	No. of Wells	No. of Springs	Miles of Fence	Cattleguards	Miles of Pipeline	Type of Management System 4/
1430	Willow Creek	756	C	Revise existing AMP	- 222				6		6	6	GS
			D	Discontinue existing AMP	- 8,838	0	0	0	0	0	0	0	None
			E	Evaluate existing AMP	+ 3,325	10,000	8		6		6	6	GS
			EM	Will follow existing AMP	+ 276	1,000							GS
			A	Evaluate existing AMP	+ 276	1,000	1						GS
			B	Will follow existing AMP	+ 476	2,000	2	1				4	GS
			C	Revise existing AMP	- 3	0							GS
			D	Will discontinue AMP	- 705	0	0	0	0	0	0	0	None
			E	Evaluate existing AMP	+ 276	1,000	1						GS
1418	Bench	1,165	EM	Will follow existing AMP	+ 717	3,000	2	1					GS
			A	Evaluate existing AMP	+ 717	3,000	2	1					GS
			B	Will follow existing AMP	+ 717	3,000	2	1					GS
			C	Revise existing AMP	- 2		2						GS
			D	Will discontinue existing AMP	- 1,150	0	0	0	0	0	0	0	None
1042	Beaver Creek	2,765	E	Evaluate existing AMP	+ 717	3,000	2	1					GS
			EM	Will follow existing AMP	+ 276	1,000			4	4	3		GS
			A	Evaluate existing AMP	+ 276	1,000			4	4	3		GS

Allotment Number	Allotment Name	Existing Livestock AUMs 1/	Alternatives 2/	Develop and Implement AMP	Change in Livestock Forage AUMs 3/	Acreage of Vegetation Manipulation	No. of Reservoirs	No. of Wells	No. of Springs	Miles of Fence	Cattleguards	Miles of Pipeline	Type of Management System 4/
1010	Poison Creek	5,000	B	Will follow existing AMP	+ 476	2,000			4	4	3		GS
			C	Revise existing AMP	- 381	0				4	4	3	GS
			D	Will discontinue existing AMP	- 2,209	0	0	0	0	0	0	0	None
			E	Evaluate existing AMP	+ 276	1,000			4	4	3		GS
			EM	Will follow existing AMP	0				2				GS
			A	Evaluate existing AMP	+ 500				2				GS
			B	Will follow existing AMP	+ 500				2				GS
			C	Revise existing AMP	- 146								GS
			D	Discontinue existing AMP	- 2,649	0	0	0	0	0	0	0	None
			E	Evaluate existing AMP	+ 500				2				GS
1038	Dempsey Basin	2,823	EM	No	0	0	0	0	0	0	0	0	None
			A	Yes	+ 582	1,500	1		3				GS
			B	Yes	+ 682	2,000	2		4				GS
			C	Yes	- 2		1		3				GS
			D	No	- 1,828	0	0	0	0	0	0	0	None
1039	Fish Creek	4,920	E	Yes	+ 582	1,500	1		3				GS
			EM	No	0	0	0	0	0	0	0	0	None
			A	Yes	+ 1,092	3,000							GS
			B	Yes	+ 1,292	4,000							GS
			C	Yes	- 344								GS
			D	No	- 3,137	0	0	0	0	0	0	0	None
			E	Yes	+ 1,092	3,000							GS

Alotment Number	Alotment Name	Existing Livestock AUMs 1/	Alternatives 2/	Develop and Implement AWP	Change in Livestock Forage AUMs 3/	Acres of Vegetation Manipulation	No. of Reservoirs	No. of Wells	No. of Springs	Miles of Fence	Cattleguards	Miles of Pipeline	Type of Management System 4/
1501	Medicine Butte	912	EM A B C D E	No Yes Yes Yes No Yes	0 + 91 + 91 0 - 912 + 91	0	0 1 2 1 1	0	0 7 9 3 0 7	0 10.5 10.5 10.5 0 10.5	0	0 1.5 2.0 0 0 1.5	None GS GS GS None GS
1413	Leavitt Bench	647	EM A B C D E	No Yes Yes Yes No Yes	0 + 135 + 164 + 6 - 402 + 135	0 350 500 350 0 350	0	0	0	0	0	0	None GS GS GS None GS
1324	Cottonwood Bench	2,258	EM A B C D E	No Yes Yes Yes No Yes	0 + 226 + 626 - 1,260 - 1,748 + 226	0 2,000 2,000 0 0	0 2 4 0 2	0 2 2	0	0 7 7	0 2 2	0 0 4 0 0	None GS GS GS None GS
1303	Lyman Cattle	2,245	EM A B C D E	No Yes Yes Yes No Yes	0 + 1,025 + 1,225 - 1,433 - 1,981 + 1,025	0 4,000 5,000 2,500 0 4,000	0 2 2 2 0 2	0 2 2 2 0 2	0 3 3 2 0 3	0	0	0 2 4 2 0 2	None GS GS GS None GS
1437	South Horse Creek	360	EM A B C D E	No Yes Yes Yes No Yes	0 + 396 + 536 + 1 - 360 + 396	0 1,800 2,500 1,000 0 1,800	0 2 3 2 0 2	0	0	0 3.5 3.5 3.5 0 3.5	0 2 2 2 0 2	0	None GS GS GS None GS
1320	Leroy	1,580	EM A B C D E	Yes Yes Yes No Yes	+ 350 + 350 - 19 - 759 + 350	0 960 960 0 960	0 2 4 0 2	0	0 1 0	0	0	0	None GS GS None GS

Allotment Number	Allotment Name	Existing Livestock AUMs 1/	Alternative 2/	Develop and AMP Implement	Change in Livestock Forage AUMs 3/	Acraege of Vegetation Manipulation	No. of Reservoirs	No. of Wells	No. of Springs	Miles of Fence	Cattleguard:	Miles of Pipeline	Type of Management System 4/
1001	Trespass Creek	144	EM A B C D E	No Yes Yes Yes No Yes	0 0 + 15 0 - 144 0	0	0	0	0	0	0	0	None GS GS GS None GS
1002	Inchauspe	2,476	EM A B C D E A	No Yes Yes Yes No Yes No	+ 248 + 548 - 645 - 1,396 + 248 + 200	0 1,500 0	0	0	0	0	0	0	None GS GS GS None GS None
1441	Lower Cottonwood	476	EM A B C D E	No No Yes No No No	0 0 + 48 - 1 476 0	0	0	0	0	0	0	0	None None GS None None None
1040	Pole Creek	1,771	EM A B C D E	No Yes Yes Yes No Yes	0 + 377 + 577 0 - 780 + 377	0 1,000 2,000 0 0 1,000	0	0	0	0	0	0	None GS GS GS None GS
1003	Hobble Creek	235	EM A B C D E	No Yes Yes Yes No Yes	0 + 24 - 24 - 1 - 235 + 24	0	0	0	0	0	0	0	None GS GS GS None GS

Allotment Number	Allotment Name	Existing Livestock AUMs 1/	Alternatives 2/	Develop and Implement AMI	Change in Livestock Forage AUMs 3/	Acreage of Vegetation Manipulation	No. of Reservoirs	No. of Wells	No. of Springs	Miles of Fence	Cattleguards	Miles of Pipeline	Type of Management System 4/	
1036	Mayfield	2,404	EM	No	0	0	0	0	0	0	0	0	None	
			A	Yes	+	240							GS	
			B	Yes	+	240								GS
			C	Yes	+	260								GS
			D	No	-	126	0	0	0	0	0	0	0	None
1048	Quakenasp Canyon	658	E	Yes	+	240							GS	
			EM	No	0	0	0	0	0	0	0	0	0	None
			A	No	0									None
			B	Yes	+	66		1	1.5					GS
			C	No	-	203								None
1302	Granger Lease	36,091	D	No	-	658	0	0	0	0	0	0	None	
			E	No	0									None
			EM	No	0	0	0	0	0	0	0	0	0	None
			A	No	0									None
			B	Yes	+	3,609		20		5				5
1449	Sage Creek	452	C	No	-10,842								None	
			D	No	-14,817	0	0	0	0	0	0	0	0	None
			E	No	0									None
			EM	No	0									None
			A	No	0									None
1317	Bridger Airport	3,507	B	Yes	+	545	2,500						GS	
			C	No	+	2								None
			D	No	-	452	0	0	0	0	0	0	0	None
			E	No	0									None
			EM	No	0	0	0	0	0	0	0	0	0	None

Allotment Number	Allotment Name	Existing Livestock AUMs 1/	Alternatives 2/	Develop and Implement AMP	Change in Livestock Forage AUMs 3/	Acreage of Vegetation Manipulation	No. of Reservoirs	No. of Wells	No. of Springs	Miles of Fence	Cattle/Guards	Miles of Pipeline	Type of Management System 4/	
1007	Sawmill Creek	790	EM A B C D E	No	0	0	0	0	0	0	0	0	None	
				No	0								None	
				Yes	+	27					3	1		GS
				No	-	2					2			None
				No	-	297	0	0	0	0	0	0		None
1004	Preacher Hollow	2,452	EM A B C D E	No	0	0	0	0	0	0	0	0	None	
				No	+	245					2			None
				Yes	+	245					2			GS
				No	+	32					2			None
				No	-	1,814	0	0	0	0	0			None
1301	Cow Hollow	1,028	EM A B C D E	No	0	0	0	0	0	0	0	0	None	
				No	0						8	1		None
				Yes	+	54					12	2		GS
				No	-	214					8	1		None
				No	-	537	0	0	0	0	0	0		None
1318	Bigelow	1,326	EM A B C D E	No	0	0	0	0	0	0	0	0	None	
				No	0									None
				Yes	+	133					9			GS
				No	-	32					0	0		None
				No	-	571	0	0	0	0	0	0		None
1442	Crooked Canyon	520	EM A B C D E	No	0	0	0	0	0	0	0	0	None	
				No	0									None
				Yes	+	52								GS
				No	-	135					0	0		None
				No	-	466	0	0	0	0	0	0		None
1408	Poverty Flat	1,065	EM A B	No	0								None	
				No	0									None
				Yes	+	107	4						GS	

Allotment Number	Allotment Name	Existing Livestock AUMs ^{1/}	Alternatives ^{2/}	Develop and Implement AMP	Change in Livestock Forage AUMs ^{3/}	Acres of Vegetation Manipulation	No. of Reservoirs	No. of Wells	No. of Springs	Miles of Fence	Cattleguards	Miles of Fence	Type of Management System ^{4/}	
1447	Highway	96	EM	No	0								None	
			A	No	0								None	
			B	Yes	+	10							GS	
			C	No	0							0	None	
			D	No	-	96	0	0	0	0	0	0	None	
			E	No	0								None	
1304	Coyote Springs	473	EM	No	0	0	0	0	0	0	0	0	None	
			A	No	0								None	
			B	Yes	+	47			1	3	3	3	3	GS
			C	No	-	2			0	0	0	0	0	None
			D	No	-	167	0	0	0	0	0	0	0	None
			E	No	0									None

1/ This includes total available AUMs in each "I" allotment, including Federal, State, and private lands.
For a complete summary of AUMs by land status, see Appendix A-7.

2/ EM = Existing Management

3/ AUM change based on: a) +10% increase in total allotment AUMs due to intensive management; b) average production of 5 acres/AUM from vegetation manipulation; C) net loss of livestock AUMs under Alternative C; d) net loss of all BLM AUMs under no grazing alternative.

4/ GS = Grazing System

APPENDIX A-3

DESIGN OF RANGE IMPROVEMENTS

All range improvements will be designed and constructed in such a manner so as to minimize environmental impact while maximizing function and cost effectiveness. Prior to the installation of any of the range improvements shown in Appendix A-2, an environmental assessment (EA) will be prepared analyzing the alternatives for the development. In addition, a benefit/cost analysis (B/C) of the various alternatives will be completed to determine the most cost effective format for each range improvement. The EA and B/C will then be used to assist in the development of the final project design. The following discussion will describe the general design features of the classes of range improvements discussed in Appendix A-2.

Brush Control

Brush control refers to the removal of a shrub or tree overstory to release the grass and forb understory from the effects of competition for soil nutrients and water. The techniques involved in brush control generally fall into one of three categories; burning, chemical and mechanical.

Burning involves the use of fire under prescribed conditions to change the character of the vegetative community. This technique takes advantage of the relative fire tolerance between plant species. Prescribed burning is most useful in removing a dominant fire sensitive overstory species, such as big sagebrush, thereby opening up the community to the natural response of fire tolerant grasses, forbs and shrubs. Prescribed fire can also be useful in preparing a seedbed for artificial reseeding. The main disadvantage to prescribed burning is its harsh initial impact on the site. Initially, ground cover is greatly reduced, erosion potential is increased, wildlife habitat is reduced and forage production is decreased. Reestablishment of vegetation on the site can be quite slow but usually results in increased productivity, palatability and species diversity while erosion potential is decreased over pre-treatment levels. The cost of prescribed burning is low compared to other techniques. Burning without reseeding can be accomplished for less than five dollars per acre as of this writing.

Chemical treatments involve the use of ground or aerially applied herbicides to target species to reduce their competitive effect on more desirable

species. Many classes of herbicides exist and they all vary in action, selectivity, and persistence. However, for brush removal on public lands relatively few compounds are approved for use. These compounds are usually selective for broadleaf vegetation and leave only grasses and tolerant forb and shrub species after treatment. If, for instance, the target species is sagebrush few species other than grasses will exist immediately following application. However, by the next growing season the seed source for other species will begin to express itself as a result of reduced overstory competition. Generally by the end of the first complete growing season increased understory productivity and species diversity are evident. Chemical treatments have less total impact on the site than burning or mechanical treatments but are usually more expensive than burning. In addition, the seedbed resulting from a chemical treatment is usually not as suitable for reseeding due to the amount of standing litter.

Mechanical treatments refer to the use of agricultural equipment to simply remove the overstory or to consume the entire community and leave a suitable seedbed. Techniques and implements are highly variable but all share the disadvantage of high cost.

All of the above brush control techniques can be used to prepare a seedbed suitable for artificial reseeding. Where needed, reseeding is a viable technique to establish a more desirable plant community. However, seed and application costs can be quite high and are sometimes difficult to prove cost effective. Wherever possible, techniques used and sites chosen on the Kemmerer Resource Area will be those that lend themselves to natural regeneration.

Reservoirs

Reservoirs are constructed by heavy earth moving equipment by constructing dikes across drainages. The impoundments created are designed to catch temporary runoff or permanent streamflow to provide a more reliable source of water for livestock and wildlife. Design requirements are determined mainly by the nature and amount of source water. Upstream fencing is sometimes desirable to provide riparian habitat and reduce the silt load entering the reservoir.

APPENDIX A-3

Wells

Wells are usually drilled in areas where other water sources are unavailable to provide a reliable water source for livestock and wildlife. Drinking troughs will be installed near the well and will be modified to serve young and mature animals as well as small game and birds. Well sites will be selected based on geologic well site investigations.

Springs

Spring sources are usually developed with a backhoe or other implement designed to expose the aquifer. Source points are gathered into a central point or head box through a perforated pipe and diverted into a pipeline or drinking trough. The spring source will be fenced for protection and to provide riparian habitat. A wildlife drinking trough may be located within the enclosure. The livestock trough will be located outside the enclosure and will also be modified for use by wildlife.

Pipelines

Pipelines consist of plastic, usually polyethylene pipe buried by mechanical pipe laying implements to a depth necessary to maximize the life and

efficiency of the pipe material. Pipelines originate at spring sources or wells and are used to distribute water to unserved areas. Drinking troughs are situated along the pipeline, usually no more than one mile apart, to distribute use throughout the area.

Fences

Fences are constructed to provide management boundaries such as to provide pastures or outside boundaries for a grazing allotment. Because of the potential for impact to wildlife movement, fence design is highly variable. Wire will be smooth, barbed mesh or combined with spacing dependant on the species involved. Steel line posts will be spaced a minimum of 16.5 feet apart. Wooden braces will usually be spaced ¼ mile apart. Fences may be modified in heavy snow or animal migration areas by using wood poles.

Cattleguards

Cattleguards will be installed where fences cross heavily traveled roads or in situations where opened gates would severely compromise management. Cattleguard grids vary in weight and size requirements but usually require a backhoe to install. Sites must be modified for drainage to reduce maintenance requirements.

APPENDIX A-4

MONITORING PLAN

FOR THE KEMMERER RESOURCE AREA

INTRODUCTION

The rangeland monitoring program is a multidisciplinary approach designed to measure progress towards the realization of the goals and objectives resulting from the land use planning process. This monitoring plan was prepared to provide for the implementation of the rangeland monitoring program in the Kemmerer Resource Area (KRA). This plan will discuss when, where, and how studies will be implemented, as well as the types of data being collected, how the data will be evaluated, and who will participate in the process.

ALLOTMENT CATEGORIZATION

The selective management process was developed to assist the Bureau in setting priorities for its management efforts. Through selective management, each allotment is placed in one of three categories ("I", "M", or "C"), depending on the applicable categorization criteria. Once categorized, the allotments are then ranked in order of priority for a given level of management. Allotments for the KRA are listed by category in Appendix A-5. Monitoring studies will be installed on these allotments in roughly the order shown beginning with the highest priority "I" allotments and ending with the lowest priority "C" category allotments. Monitoring intensity will be greater on "I" allotments than on "M" or "C" allotments.

OBJECTIVES

For "I" Allotments (high intensity)

1. Identify grazing distribution problems and use patterns on each allotment prior to installation of trend studies.
2. Stratify each allotment to the level necessary to identify key management areas prior to installation of trend studies. Riparian areas and wet meadows will be considered in this process.

3. Identify areas of significant competition for forage and resolve these conflicts by adjusting stocking rates or seasons of use of competing species.
4. Identify key management species for each key area.
5. Determine range condition initially and trend starting five years from installation of trend studies on each allotment.
6. Provide management and monitoring intensity appropriate to improve range condition.
7. Determine current utilization levels in each allotment.
8. Determine actual use by livestock on each allotment.
9. Identify annual climatic patterns which includes precipitation. Soil temperature, soil moisture, and air temperature information will be obtained on selected key areas.

For "M" and "C" Allotments (low intensity, selected elements from the following list will be used)

1. Identify grazing distribution problems and use patterns, where necessary.
2. Identify areas of significant competition for forage and monitor only crucial habitats.
3. Stratify each allotment only to a level necessary to identify key management areas.
4. Identify key management species for each key area.
5. Establish low intensity trend studies on only the most representative key areas. Determine range site and range condition following development.
6. Provide management and monitoring intensity appropriate to maintain current range condition.
7. Determine current utilization levels in each allotment.
8. Determine actual use by livestock.
9. Identify general climatic patterns.

MONITORING STUDIES METHODOLOGY

Climate

1. Climatic data, along with actual use data, are used as a tool to help understand annual utilization and long term trend patterns. There are 17 existing precipitation gauges (including a cooperative study with the University of Wyoming) on the KRA. Ten additional gauges will be required to provide the coverage needed. In addition, precipitation data from the National Climate Data Center and the University of Wyoming Water Research Institute may be utilized.

2. Temperature data will also be used to assist in interpreting climatic effects on monitoring data. Temperature data will be obtained from National Climatic Data Center Reports from sites at Mountain View, Evanston, Church Buttes, Kemmerer, Sage, Fontenelle Dam, Border, and Afton, Wyoming.

In addition to the precipitation and temperature studies described above, soil moisture/temperature probes will be installed on selected key areas in "I" allotments where conflicts are sufficient to warrant this level of data.

Actual Use

Actual use is the grazing use made on an area by all classes of forage consumers. This information is necessary to provide a correlation between utilization and trend data. Considered alone, actual use data is essentially meaningless. When considered in conjunction with climate and utilization, short term adjustments in grazing capacity can be made. Long term adjustments can be made with the addition of trend data.

Actual use data for livestock will be obtained from permittees/lessees by Certified Actual Use Reports annually or at the end of specified grazing periods. This requirement will be stipulated as a condition of the permit/lease for all "I" allotments. In addition, unannounced field counts will be made each year on "I" allotments as time and money allow. Paint branding and ear tagging will also be used on "I" allotments where the potential for unauthorized use is greatest.

Utilization

Utilization is defined as the percent of current years growth consumed by animals during a given grazing period. These data are used in conjunction with actual use, climate, and trend data to make either short or long term stocking adjustments. This is done by comparing measured utilization rates with proper or allowable rates for a particular key species. Utilization techniques will also be used to assist in use pattern mapping. Several methods for obtaining utilization data (available for review in the KRA office) will be employed including:

1. Key Forage Plant Method for use pattern mapping.
2. Ocular Estimate by Plot Method for key areas.
3. Height-Weight Curves for key areas on selected "I" allotments.
4. Paired Plot Method for riparian areas.
5. Cole Browse Transect for wildlife or wildlife/livestock areas.

These data will be collected following the removal of livestock from a pasture or at the end of a grazing period for livestock or wildlife. The intensity with which these techniques will be applied will be highest in the "I" allotments. The "M" and "C" allotments will be monitored only to a level sufficient to identify changes in current range condition.

Trend

Trend is defined as the change in range condition over time. Trend data will indicate the direction of change in the general health of the range resource. These data will be used in conjunction with other monitoring data to assist in making long term adjustments in grazing use.

Trend studies on "I" allotments will be of high intensity. These studies will include the installation of permanent plot transects on each key area. Existing 3-foot by 3-foot trend plots will be replaced with this method where they fall into the key area being monitored. However, these existing plots will continue to be photographed on the same sequence that the trend plot transects are being read.

Appendix A-4

Trend studies on "M" and "C" allotments will be of low intensity. Trend plots will be installed only on selected key areas to monitor for specific resource issues. To assist in this effort, an ocular estimate of species composition by weight will be used to establish a baseline for range condition in areas lacking soil survey data. This method will also be used as a check for future changes in range condition on these sites.

Trend studies will normally be read on a three to five year sequence, depending on the level of data required for each key area.

Key Area Selection

Key areas will be selected first on "I" allotments in approximately the same order as listed in Appendix A-5. Selection of key areas on "M" and "C" allotments may be integrated with the process for "I" allotments but no actions will occur on them at the expense of time that should be spent on higher priority allotments.

Some of the criteria to be considered in the selection of key areas include: range sites, vegetation types, use patterns, range improvements, kind and class of animal, wildlife crucial areas, and the physical feature of the allotment.

SCHEDULES AND PERSONNEL REQUIREMENTS FOR ESTABLISHMENT AND READING OF STUDIES

This monitoring plan was prepared with the assumption that funding will remain at, or near, existing levels for the foreseeable future. In this light, it is anticipated that the bulk of the monitoring load will have to be borne by the existing range staff plus one summer temporary position each year for the duration of the monitoring program.

The scheduling for implementation of this monitoring plan is dependent, in part, on the continued funding of the current soil survey being conducted for the KRA. Any interruption of this schedule will compromise the ability of the KRA to complete the range site/range condition determinations. The initial thrust of the monitoring program will be towards completion of the high priority "I" allotments. Low priority "I",

as well as the "M" and "C" allotments will be addressed as completely as funding levels allow.

COORDINATION AND CONSULTATION

The rangeland monitoring program for the KRA is a multiple use effort whereby all affected interests will be given an opportunity to participate. Prior to implementation of this plan, any affected groups or individuals will be notified by mail of our intent and be furnished with a schedule covering the first group of allotments. Follow-up consultations will be made to those groups or individuals who expressed an interest in a given allotment to advise them of the time and place to meet for an initial field examination. This process will carry through all aspects of the monitoring program for each allotment.

EVALUATION/ADJUSTMENT

Analysis and evaluation of monitoring data will be an ongoing process directed towards discerning changes in resource conditions with the ultimate goal of establishing proper stocking rates over the entire allotment. Ideally, data will be analyzed for each key area following re-evaluation of the trend studies (every three to five years). This schedule will provide an opportunity for periodically summarizing climatic, actual use, and utilization data to assist in interpretation of trend readings.

Allotments will be evaluated on a predetermined schedule such as the end of a grazing cycle on AMP allotments or following one reading of all the trend studies on a non-AMP allotment. This process will be coordinated with all affected interests as stated in Section VI above.

The results of these allotment evaluations will be used as a basis for making short or long term adjustments in livestock operations. Short term operational adjustments may be made immediately if the problem can be resolved through livestock management (herding, salting, etc.). Short term adjustments in stocking rates, seasons of use, or changes in kind of livestock will normally require two years of utilization, actual use, and climatic data. Long term adjustments in stocking rates, seasons of use, etc., will result from the interpretation of trend studies over two or more cycles of trend readings in an allotment.

Appendix A-4

If the monitoring data indicates that certain allotment objectives are not being met, then the appropriate adjustments in the grazing operation will be made. These adjustments may range from the manipulation of livestock to changing stocking numbers or seasons of use. The level of adjustment will be determined by the degree of divergence from the objective.

ALLOTMENT MONITORING PLANS

Allotment specific monitoring plans will be prepared for all "I" allotments prior to initiation of the monitoring program. On AMP allotments, this will be included as a portion of the AMP. On non-AMP allotments, this plan will be included in the allotment file. The allotment monitoring plan will include, as a minimum, the following:

Public Involvement and Interdisciplinary Approach

This section will document the Bureau's efforts to solicit public involvement as well as provide a record of all meetings and correspondence concerning the plan. This section will also document the participants in all stages of the monitoring process.

Allotment Issues

This section will identify specific issues to be resolved by the management program prescribed for the allotment. The monitoring plan will provide the vehicle for measuring progress towards resolution of the issues. A discussion of the

selective management category and accompanying justification will also be included.

Allotment Objectives

This section will contain a clear, concise list of measurable allotment management and key area objectives to be monitored by the studies program. Locations for each key area will be shown (and mapped) and key species will be identified.

Intensity and Type of Studies

This section will discuss the nature of the studies required to measure progress towards the allotment and key area objectives identified above. A discussion of any special physical or management features for the allotment will also be included.

Schedule for Conducting, Analyzing, and Evaluating Monitoring Data

This section will show, by key area, the schedule for collecting data for each monitoring technique. It will also provide a schedule for periodic analysis of data to determine if objectives are being met. This section will also show the anticipated date for the evaluation of the allotment to determine if any stocking adjustments are necessary. A discussion of management alternatives (short and long term) in the case that objectives are not being met will also be included.

A modified version of this format may be used to document the monitoring effort on "M" and "C" allotments. This plan will be retained in the studies section of the allotment file.

APPENDIX A-5

ALLOTMENT CATEGORIZATION

SELECTIVE MANAGEMENT CRITERIA BY CATEGORY

Category M

Present range condition is satisfactory.

Allotments have moderate or high resource production potential and are producing near their potential (or trend is moving in that direction).

Present management is considered satisfactory.

Riparian areas are under satisfactory management and are not in a declining trend.

No serious conflicts exist with regard to current uses of resource.

Potential may exist for positive economic returns on public investments.

Category I

Present range condition is unsatisfactory or in a declining trend.

Allotments have moderate to high resource production potential and are producing at low to moderate levels.

Present management is considered unsatisfactory.

Riparian areas are presently in a declining trend and management is unsatisfactory.

Serious resource use conflicts may exist and controversy is at a high level.

Potential for high return on public investment exists.

Category C

Present range condition is variable.

Allotments have relatively low resource production potential and are presently producing at or near their potential.

Present management appears satisfactory or is the only logical practice under existing resource conditions.

Riparian areas are either not present, or are not in a declining condition.

Limited resource conflicts and/or controversy presently exist.

Potential for returns on public investment is low.

SELECTIVE MANAGEMENT CRITERIA BY SITUATION

Range Condition

A professional judgment criteria used when there is a lack of ecological range site data. A subjective rating of what the area is now producing as compared to its potential.

Resource Potential

A professional judgment criteria used to determine the allotment's potential (capability) to improve. This criteria is based on the potential that exists for increased forage production, either naturally or artificially.

High Potential - I
Moderate Potential - M
Low Potential - C or M

Present Management Situation

A rating of allotments based on present range management practices.

Allotment is receiving satisfactory management - M or C
Allotment is receiving unsatisfactory management - I

Riparian Areas

A judgment of whether or not riparian vegetation is declining, static, or in an upward trend.

Declining trend - I
Static or upward trend - M or C

Appendix A-5

Resource Use Conflicts and/or Controversy

Critical wildlife habitat areas, Wilderness Study Areas, ACECs, mining or oil and gas and other conflicts that may exist.

Low level of conflict/controversy - M or C

High level of conflict/controversy - I

Economic Investment Potential

The potential for a positive economic return on investments.

High - I

May exist - M

Low - C

APPENDIX A-5
ALLOTMENT CATEGORIES

No.	Allotment Name	Range Condition	Resource Potential	Present Management Situation	Riparian Areas	Resource Conflicts	Economic Potential	Final Designation
1001	Trespass Creek	M	M	I	I	C	M	I
1002	Inchauspe	M	M	M	I	C	C	I
1003	Hobble Creek	M	M	M	I	C	C	I
1004	Preacher Hollow	M	M	M	I	C	M	I
1005	Smith's Fork	M-I	I	I	I	I	M	I
1006	Reed	M	C	M	I	C	C	M
1007	Sawmill Creek	I	I	I	I	M	M	I
1009	Erwin Creek	M	M	M	M	C	M	M
1010	Poison Creek	M	M	I	I	M	M	I
1012	Boyd Hollow	M	M	M	M	C	M	M
1014	Christy Canyon	M	M	M	M	C	C	M
1015	Goblin Gulch	M	M	M	M	C	C	M
1016	South Lake	M	C	M	C	M	C	M
1017	Leefe	M	M	M	M	I	M	M
1018	Quealy Reservoir	I	M	M	I	M	M	M
1019	Chapel Creek	M	M	M	I	M	M	M
1020	Grade Creek	M	M	M	I	M	M	M
1021	Lund Draw	M	M	M	I	M	M	M
1022	Seizmore	M	M	I	I	M	M	M
1023	Stoner	M	M	I	I	M	M	M
1024	Ryan Creek	M	M	M	I	M	M	M
1025	Sublette Pasture	I	M	M	I	M	M	M
1026	Lost Creek	M	M	M	I	M	M	I
1027	Underwood	M	M	M	I	M	M	I
1029	Orr	M	M	M	M	M	M	M
1030	Pine Creek	I	M	C	I	I	C	M
1031	Sublette Canyon	M	M	I	I	I	C	M
1032	Hoodoo	M	M	I	I	M	C	M
1033	Tom Goure	M	M	I	I	M	C	M
1034	Slide Rock	M	M	C	I	M	M	M
1035	Rock Creek	M	M	M	I	I	I	I
1036	Mayfield	M	I	M	M	M	M	I
1037	Wilkinson Creek	I	M	C	I	I	C	M
1038	Dempsey Basin	I	M	M	I	I	I	I
1039	Fish Creek	M	M	M	I	I	I	I
1040	Pole Creek	M	I	M	I	I	M	I
1041	East Fork	M	M	M	M	C	C	M
1042	Beaver Creek	M	I	M	I	M	I	I
1043	Commissary	M	M	I	C	M	C	M
1044	Granny Peak	M	M	C	M	M	C	I
1045	Lake Creek	M	M	C	I	M	C	I
1046	Trail Creek	I	M	C	I	I	C	I
1047	Commissary	M	M	C	I	M	M	M
1048	Quakenasp Canyon	M	M	M	I	M	M	I
1049	Westphal Creek	M	M	M	I	M	M	M
1050	Sawmill	M	M	M	I	M	M	M
1051	West Willow Creek	M	M	C	M	C	C	C
1052	Airport	I	M	I	M	I	M	M
1055	Curtis	M	M	M	M	M	M	M
1056	Moyer	M	C	M	C	I	C	M
1057	Larson	M	C	M	C	M	C	M
1101	Clear Creek	M	M	M	M	M	M	M
1102	Fontenelle Basin	M	M	M	M	M	M	M
1103	South Fontenelle	M	M	M	M	M	M	M
1104	Bartlett Creek	M	M	M	M	M	M	M
1105	Mammoth Hallow	M	M	M	M	I	M	M
1106	Everly Creek	M	M	M	M	I	M	M
1107	Pomeroy Basin	M	M	M	M	I	M	M
1108	Hood	C	C	C	C	M	C	M
1109	Colletti	M	M	M	I	C	C	M
1110	Quealy Peak	M	M	M	M	M	M	M
1111	Graham	M	C	M	M	M	C	M
1112	Seedskaadee	M	C	I	C	M	M	M
1113	Slate Creek	M	M	I	I	I	I	I
1201	Fossil	M	C	M	M	I	C	M
1202	Albert Creek	M	M	M	M	M	M	M
1204	Border	M	C	M	M	M	C	M
1205	State Line	M	C	M	M	M	C	M
1206	Cumberland & Uinta	I	I	I	I	I	I	I
1207	Sage	C	C	C	C	I	C	C
1301	Cow Hollow	I	I	I	C	I	C	I
1302	Granger Lease	M	M	M	I	M	M	I
1303	Lyman Cattle	I	I	I	I	M	I	I
1304	Coyote Springs	I	I	I	C	M	I	I
1305	Hassett	M	M	M	C	M	M	M
1306	Carter	M	M	M	M	I	M	M
1308	Monument	M	C	M	C	I	C	C
1310	South Monument	M	C	M	M	C	C	C
1311	Austin Place	M	C	M	C	C	C	C
1312	Austin Triangle	M	M	M	I	M	M-C	M
1313	Nipple	M	M	M	C	M	C	M
1314	Hanblin	M	C	M	C	C	C	C
1315	Oaks	M	C	M	C	C	C	C
1316	Upper Ranch	M	C	C	M	C	C	C
1317	Bridger Airport	M	M	M	I	C	I	I
1318	Bigelow	M	M	M	M	M	M	I
1319	Coal Mine Draw	M	M	C	M	M	C	M
1320	Leroy	I	I	I	I	I	M	I
1321	Nelson Section	M	C	M	C	C	C	M
1322	Opal	M	C	M	C	M	C	M
1323	Nutria	M	M	M	C	C	C	M
1324	Cottonwood Bench	I	I	I	I	M	I	I
1325	Roberson Creek	M	M	M	I	M	M	M
1326	H. F.	M	M	M	M	M	M	M

APPENDIX A-5

No.	Allotment Name	Range Condition	Resource Potential	Present Management Situation	Riparian Areas	Resource Conflicts	Economic Potential	Final Designation
1401	Toomer	M	M	M	C	C	C	M
1402	Fort Bridger	M	M	M	I	M	M	M
1403	Nebraska Flat	I	M	M	I	M	M	M
1404	Milburne	M	M	M	C	M	M	M
1405	Spring Creek	M	M	M	I	M	M	M
1406	Little Creek	M	M	M	I	M	M	M
1408	Poverty Flat	I	C	C	C	I	C	I
1409	Lower Bench	C	C	M	C	C	C	C
1410	Jackman	C	C	M	C	C	C	C
1411	Tipperary	C	C	M	C	C	C	C
1412	Courley	C	C	M	C	C	C	C
1413	Leavitt Bench	I	M	I	I	M	M	I
1414	Cottonwood	M	M	M	I	M	M	M
1415	Sidehill	C	C	M	I	C	C	C
1417	Dry Creek Bench	C	C	C	I	C	C	C
1418	Bench	M	M	I	M	M	M	I
1419	Coyote Hollow	C	C	M	C	C	C	C
1420	Johnson	M	M	M	I	C	C	M
1421	Smith	M	M	M	M	M	M	M
1422	Smith's Fork	M	M	M	M	M	M	M
1423	Murray Reservoir	M	M	M	M	I	M	M
1424	Graham Reservoir	M	M	M	I	C	M	M
1425	Timber Place	M	M	M	M	M	M	M
1426	Domingo	M	M	M	M	M	M	M
1427	Murray Ditch	M	M	M	I	M	M	M
1428	Westfork	M	M	M	M	M	M	M
1429	Thunderbolt	M	M	M	M	M	M	M
1430	Willow Creek	M	I	M	M	M	M	I
1431	Yellow Hollow Creek	M	M	M	M	M	M	M
1432	Wall	M	M	M	M	M	M	M
1434	Bond	I	M	I	C	C	M	C
1435	North Horse Creek	M	I	M	M	M	M	M
1436	Sage Chicken Flat	M	M	M	M	M	M	M
1437	South Horse Creek	I	I	I	I	M	M	I
1438	Horse Creek	M	M	M	M	M	M	M
1439	Crowfoot	M	M	M	M	M	M	M
1440	Bridger Butte	M	M	M	M	C	M	M
1441	Lower Cottonwood	I	M	M	M	C	M	I
1442	Crooked Canyon	M	C	M	C	C	C	I
1443	Rocky Springs	I	M	M	M	C	C	M
1444	Dutchy Hollow	M	M	M	M	C	C	M
1445	Hanna Johnson	I	M	M	I	C	C	M
1446	Quarry Creek	M	M	M	C	I	C	M
1447	Highway	I	C	C	C	I	C	I
1448	Fourty	M	M	M	M	M	M	M
1449	Sage Creek	I	M	M	M	C	M	I
1450	Dry Canyon	M	C	C	M	C	C	C
1451	Half Sec Horse Creek	M	I	M	C	M	C	M
1452	Upper Flat	C	C	M	C	C	C	C
1453	Wall Reservoir	C	C	M	M	I	C	C
1454	Upper Sage Creek	M	M	M	I	M	M	M
1501	Medicine Butte	I	I	I	I	I	M	I
1502	Spring Canyon	M	M	M	M	M	M	M
1503	Rock House	M	M	M	M	M	M	M
1504	Crompton Reservoir	M	M	M	M	M	M	M
1505	Byrne Creek	M	M	M	M	M	M	M
1506	Valley Creek	M	M	M	M	I	M	M
1507	Heinsaw Creek	M	M	M	M	I	M	M
1509	Toms Draw	M	M	M	M	I	M	M
1510	Haystack Draw	M	M	M	I	I	M	M
1511	Bigelow Ditch	M	M	M	C	M	C	C
1512	Meeks Cabin	M	I	M	I	M	M	M
1513	Closscock Hollow	M	C	C	C	C	C	C
1514	Aspen	C	C	C	C	C	C	C
1515	Johnson	M	M	M	M	C	C	M
1516	Duel	M	M	M	M	C	C	M
1517	Wasatch	M	I	M	I	I	M	M
1518	Coyote Creek	M	I	M	M	M	C	M
1519	Barker	M	M	M	C	C	M	M
1520	Yellow Creek	M	C	M	C	C	C	C
1521	The Boilers Draw	M	M	M	I	I	C	M
1522	East Branch	M	M	M	I	M	M	M
1523	Murphy Ridge	M	M	M	I	I	C	M
1524	Cook	M	M	M	I	I	C	M
1525	Blake Hollow	M	M	M	I	I	C	M
1526	Stowe Creek	M	M	M	I	I	C	M
1527	Hague Creek	C	C	C	C	I	C	C
1528	Guild Ranch	M	M	M	I	C	C	M
1529	Balsam Draw	M	M	M	M	M	C	M
1530	Stoney Run	C	C	C	C	C	C	C
1531	Sulphur Creek	M	C	M	I	M	C	M
1533	21 Crove	M	M	M	M	M	C	M
1534	Moslander Ranch	M	M	M	M	C	C	M
1535	Myers	M	M	M	I	I	C	M
1536	Sims Canyon	C	C	M	I	I	C	M
1537	Thomas Canyon	M	M	M	I	I	M	M
1538	Turner	C	C	C	C	I	C	C
1539	Moss Creek	M	C	C	C	C	C	C
1540	Ring	C	C	C	C	C	C	C
1541	Dry Creek	C	C	C	C	C	C	C
1543	Stewart Creek	C	C	C	C	C	C	C
1544	Cedar Creek	C	C	C	C	C	C	C
1545	Smith Canyon	C	C	C	C	C	C	C
1546	Herman Canyon	C	C	C	C	C	C	C

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No.	Allotment Name	Range Condition	Resource Potential	Present Management Situation	Riparian Areas	Resource Conflicts	Economic Potential	Final Designation
1547	Salt River	C	C	C	C	C	C	C
1548	Hemmett Lease	C	C	C	C	C	C	C
1549	Heiner Lease	C	C	C	C	C	C	C
1550	Willow Creek	C	C	C	C	C	C	C
1551	Dutson Canyon	C	C	C	C	C	C	C
1552	Marthas Canyon	C	C	C	C	C	C	C
1553	Graveyard Canyon	C	C	C	C	C	C	C
1554	Wickup Knoll	C	C	C	C	C	C	C
1556	Crow Point	C	C	C	C	C	C	C
1557	Crow Creek	C	C	C	C	C	C	C
1558	Hardmans Hollow	C	C	C	C	C	C	C
1559	Spring Creek	C	C	C	C	C	C	C
1560	Smith Lease	C	C	C	C	C	C	C
1561	Johnson Lease	C	C	C	C	C	C	C
1562	East Fork Creek	C	C	C	C	C	C	C
1563	Cedar	C	C	C	C	C	C	C
1564	Sec. 33 Lease	C	C	C	C	C	C	C
1565	Dry Canyon	C	C	C	C	C	C	C
1566	Merritt	C	C	C	C	C	C	C
1567	Brown	C	C	C	C	C	C	C
1568	Ralon	C	C	C	C	C	C	C

APPENDIX A-6

RANGE MANAGEMENT OPPORTUNITIES "I" ALLOTMENTS

No.	Allotment Name	Resource Conflicts/Problems	Resource Management Objectives/ Opportunities	Priority Ranking
1005	Smith's Fork	Poor livestock distribution. Some riparian/wet meadow areas being overgrazed by livestock. Conflicts between wildlife/watershed and livestock grazing. Potential conflicts with energy development and other resources. Wildlife ACEC area. Some problems with unauthorized use by livestock. Accelerated soil erosion.	Need to improve distribution by developing water for livestock salting and herding away from bottoms. Need to determine proper stocking rate through monitoring. Potential for vegetation manipulation on loamy range sites. Need to implement a grazing system based on the phenological requirements of the vegetation. Current program of dye marking cattle will be continued. Need to implement watershed management plan.	1
1206	Cumberland/Uints	Poor livestock distribution. Some riparian/wet meadow areas are being overgrazed. Conflicts between wildlife and livestock. Crawford Mountain winter range - livestock are using Crawford Mountain's too late in the fall, possibly taking too much forage from big game winter range. Oil and gas fields developed in the area are conflicting with other resources. Problems with suspected unauthorized use. Allotment is so large that, for all practical purposes, no management is being practiced on the area. Some areas in west portion of allotment are in poor condition. Conflicts between cattle and sheep operators. Accelerated soil erosion.	Need to improve developing livestock distribution by water salting and herding away from bottoms. Need management designed to lessen impacts from livestock use in late fall on Crawford Mountain winter range. Need to convert brushland to grassland to mitigate oil and gas development impacts to livestock forage resource base. Higher level of use supervision. Allotment needs to be broken up into smaller, more manageable sized units. An AMP needs to be developed. Areas in poor condition will be improved through management. Need to monitor allotment to establish proper stocking rates.	2
1035	Rock Creek	Livestock distribution needs to be improved. Some reconstruction of reservoirs necessary. Additional grazing pressure as a result of impending closure of adjacent National Park Service lands to livestock grazing. Unauthorized use by livestock is also a problem. Dense stands of unpalatable shrubs in some areas. Possible conflicts between livestock and wildlife due to competition for forage.	New waters need to be developed to distribute livestock more evenly. Monitoring needs to be implemented to establish proper stocking rates. Rock Creek AMP still needs to be completely implemented. More intense use supervision needed. Vegetation manipulation needed to convert brushland to grassland. Improve forage conditions on the allotment for watershed improvement, forage for livestock, reduction of erosion rates and enhancement of big game winter ranges.	3
1113	Slate Creek	Poor livestock distribution patterns - bottoms being over utilized. Conflicts between oil and gas development and other resources. Potential conflicts between livestock users (sheep vs. cattle). Accelerated soil erosion.	Need to develop waters, salt away from drainages. An AMP needs to be developed to split allotment into smaller more manageable units. Establish monitoring to determine proper stocking rates. Need to develop watershed management plan. Watershed management practices need to be implemented.	4
1430	Willow Creek	Some fences are in poor condition. Livestock should be distributed more evenly. Some areas currently in fair and poor condition should be improved. AMP is only partially implemented.	Complete implementation of Willow Creek Allotment Management Plan. Improvements such as brush control, water developments, should be constructed as funding becomes available. Fences should be maintained and/or reconstructed in order to control livestock. Implement monitoring to determine proper stocking levels.	5
1418	Bench	Livestock distribution could be improved. Conflicts between wildlife/livestock grazing. Riparian areas over utilized. elk in pasture adjoining Wasatch National Forest through improved distribution and control of livestock.	Need to develop water near center of allotment. To maintain or improve watershed condition and to improve winter/spring habitat for	6

No.	Allotment Name	Resource Conflicts/Problems	Resource Management Objectives/ Opportunities	Priority Ranking
1042	Beaver Creek	Livestock distribution needs to be improved. Fences are in substandard condition. Allotment has a history of unauthorized grazing use by livestock. Also some conflicts with heavy use by livestock on riparian areas.	Additional water should be developed. Fences should be maintained and additional brush control should be done. This allotment is currently managed under an AMP which should be evaluated. Additional monitoring studies and a suitability study should be undertaken to establish proper stocking. The current program of dye marking cattle should be continued and use supervision should be done at a higher intensity.	7
1010	Poison Creek	Livestock distribution needs to be improved. Some overuse of riparian areas.	Develop more waters for livestock. Some brush control is needed. Evaluate existing AMP.	8
1038	Dempsey Basin	Some evidence of declining riparian conditions due to overgrazing. Livestock distribution needs to be improved.	This allotment is currently managed under an informal grazing system. A formal allotment management plan needs to be developed. More water, fencing, and brush control are needed to improve forage conditions on the allotment. Monitoring will be done to determine proper stocking rates for the area.	9
1039	Fish Creek	Livestock distribution needs to be improved to enhance riparian areas. Some conflicts between geophysical exploration and other resources. Some past evidence of unauthorized use by livestock.	This allotment is currently managed under an informal grazing system. Additional waters, brush control, and fencing should be implemented to improve conditions on the allotment. Monitoring studies should be undertaken to establish the proper stocking rate, and an AMP should be written and implemented. Dye marking cattle will be continued as in the past.	10
1501	Medicine Butte	Conflicts between oil and gas development and other resources. Some areas appear to be over utilized by livestock. Livestock distribution needs to be improved.	This allotment has an allotment management plan written for it, but not implemented due to a lack of funding. Evaluate/revise AMP then implement it. Monitoring needed to determine proper stocking.	11
1413	Leavitt Bench	Livestock distribution needs to be improved. Evidence of overuse of riparian zones. Allotment is currently carrying more active preference than the adjudication calls for.	Monitoring studies need to be implemented to determine proper stocking. Range improvements are needed to improve distribution of livestock and control livestock. Has informal grazing system in place. An AMP needs to be developed for the allotment.	12
1324	Cottonwood Bench	Unauthorized use by livestock. Need better livestock distribution on allotment. Problems with unauthorized garbage dumps on allotment.	Need to complete construction of boundary fence. Additional waters should be developed. Should be incorporated into an AMP with the adjoining Lyman Cattle allotment to improve management. Monitoring needed to establish proper stocking rates. Use supervision needs to be stepped up to detect unauthorized use.	13
1303	Lyman Cattle	Adequate livestock distribution is prevented due to a lack of water on southwest portion of allotment. Structural improvements in degraded condition. Allotment may be over obligated due to error in adjudication. Five year average licensed livestock use exceeds the current adjudicated preference.	Develop waters in the Grizzle Butte area. Need to maintain and reconstruct improvements. Monitor to establish proper stocking rates. An AMP needs to be developed in conjunction with the Cottonwood Bench allotment to facilitate management of the area and alleviate the resource conflicts.	14
1437	South Horse Creek	Declining range condition. Low density of desirable forage species. Structural improvements are in substandard condition. Distribution of livestock needs to be improved. Need of an AMP.	Fencing and water developments needed. Maintenance of existing improvements needed. Brush control also needed. Monitoring needed to determine proper stocking rates. This allotment is in	15
1320	Leroy	Some evidence of over utilization in some areas. Conflicts between livestock grazing and deer and antelope use. Livestock distribution needs to be improved. Range condition also needs improvement.	Monitoring needs to be established to determine proper stocking. Brush control and water developments, as well as some fencing are needed to control livestock and improve forage quantity and quality. Develop an AMP.	16

No.	Allotment Name	Resource Conflicts/Problems	Resource Management Objectives/ Opportunities	Priority Ranking
1001	Trespass Creek	Livestock distribution needs to be improved. Better control of livestock is needed.	Develop waters and fence west side of allotment to effect better control of livestock. A joint management plan needs to be developed with the Forest Service. Combine allotment with Inchauspe allotment and adjacent Forest Service allotment into a grazing system. The same permittee uses all three allotments. Proper stocking rates should be determined through monitoring.	17
1002	Inchauspe	Livestock distribution needs to be improved. Some over-utilization of riparian areas.	This allotment is a good candidate for a joint cooperative management plan with the Forest Service. The adjacent Forest Service allotment, Creek Trespass Allotment, and this allotment are grazed by the same permittee, and are currently under an informal three pasture deferred system. Range improvements should be implemented to improve livestock distribution, and increase forage quantity and quality. Monitoring studies should be initiated to determine the proper stocking rate.	18
1441	Lower Cottonwood	Livestock distribution should be improved. Needs management in order to improve forage conditions on the allotment.	More range improvements should be implemented such as water, fencing and conversion of brushland to grassland. This allotment is currently operated under an informal grazing system. An AMP should be developed on the allotment. Implement monitoring studies.	19
1040	Pole Creek	Some evidence of over utilization on portions of the allotment. Livestock distribution needs to be improved.	This allotment would be a good candidate for a joint management plan between BLM and Forest Service. Same operator uses the adjoining Forest Service allotment. Monitoring needs to be done to determine the proper stocking rate, and range improvements are needed to control and distribute livestock more effectively.	20
1003	Hobble Creek	Some evidence of over utilization of riparian areas. Livestock distribution needs to be improved.	Monitoring studies are needed to determine proper stocking. Some water developments and vegetation manipulation needs to be done to improve livestock distribution and forage conditions. This allotment may be a candidate for a joint management plan between BLM and Forest Service.	21
1036	Mayfield	Average use over the last five years appears to be greater than the grazing preference adjudicated for the allotment. Distribution of livestock needs to be improved.	Monitoring studies should be initiated to determine the proper stocking rate. This allotment is a possible candidate for a joint cooperative management plan between BLM and Forest Service. Necessary range improvements will be implemented to increase livestock distribution and to improve forage conditions on the allotment.	22
1048	Quakenasp Canyon	Stocking rates are questionable. Livestock distribution needs to be improved. Forage conditions need to be improved over the allotment.	Monitoring studies should be initiated in order to determine what the proper stocking rate should be. Additional livestock watering sources should be developed, as well as implementation of brush control.	23
1302	Granger Lease	This allotment is carrying more active grazing preference than the adjudication calls for. Livestock distribution needs to be improved. Some evidence of unauthorized grazing use by livestock from adjoining allotments. Checkerboard land pattern and allotment size inhibit management. Accelerated soil erosion.	Monitoring needs to be initiated to determine the proper stocking level. Water development and brush control are needed. Unauthorized use detection and use supervision should be done at a more intensive level. This allotment should be placed under a more formalized type of management in order to achieve resource management objectives.	24

No.	Allotment Name	Resource Conflicts/Problems	Resource Management Objectives/ Opportunities	Priority Ranking
1449	Sage Creek	Some riparian areas are overgrazed. Conflicts between wildlife and livestock grazing.	Determine the monitoring system to be used for riparian areas. Water should be developed to facilitate better livestock distribution. Monitoring is needed to determine the proper stocking rate for the allotment.	25
1317	Bridger Airport	Inadequate livestock distribution is a problem. Unauthorized grazing from adjoining allotments. Boundary line dispute with Bigelow Allotment. Conflicts between livestock grazing and other land uses.	Water, fencing, and brush control should be implemented to better control livestock and to improve quantity and quality of forage. Monitoring should be done to establish proper stocking rates. Use supervision and detection of unauthorized grazing by livestock should be stepped up.	26
1007	Sawmill Creek	Some evidence of overuse of riparian areas by livestock. Livestock distribution needs to be improved. Allotment boundary requires fencing.	Monitor to establish proper stocking rates for allotment. Conduct suitability studies. Fence boundary with Forest Service to control livestock movements. Develop waters and salt/herd cattle away from drainage bottoms. Some brush control needed.	27
1004	Preacher Hollow	Evidence of overuse of riparian areas by livestock. Need to improve livestock distribution.	Need to develop waters for livestock and control brush. Also salt herd away from drainage bottoms. A study of suitability and monitoring needed to determine proper stocking rates.	28
1301	Cow Hollow	Unauthorized use by sheep. Livestock distribution needs to be improved. Current active preference is greater than the adjudicated grazing preference.	Complete fencing of allotment boundary. Develop waters for livestock. Need to monitor to determine proper stocking rates.	29
1318	Bigelow Bench	The allotment boundary between this allotment and the Bridger Airport allotment is in dispute. Livestock distribution needs to be improved. Some evidence of over utilization of riparian areas.	Need to settle boundary dispute. Range improvement projects are needed to improve control and distribution of livestock, as well as to improve forage quality and quantity. Monitoring studies are needed to determine the proper stocking rate for the allotment.	30
1442	Crooked Canyon	Stocking rates appear to be questionable on the allotment. Riparian zones may be declining in condition. Livestock distribution needs to be improved. Some soil loss due to erosion.	Need to determine proper stocking rates through monitoring studies. Range improvements should be implemented to improve livestock distribution and to prevent further decline of riparian areas. Management is needed to minimize soil erosion.	31
1408	Poverty Flat	Stocking rate at the present time is questionable. Some unauthorized livestock use from adjoining Cottonwood Bench allotment because of lack of water for livestock on the Bench. Livestock distribution needs to be improved. Forage conditions need to be improved.	Need to conduct monitoring studies to determine proper stocking rate. East boundary of allotment needs to be fenced in order to reduce unauthorized use. Additional livestock water needs to be developed to improve distribution.	32
1304	Coyote Springs	Poor distribution of livestock. Operator has to haul water to livestock.	Water developments are needed for better distribution. Establish proper stocking rates through monitoring.	33
1046	Trail Creek	Evidence of over utilization of riparian areas. Livestock distribution needs to be improved.	Monitoring studies need to be implemented on allotment to determine the proper stocking rate. Range improvements are needed to improve livestock distribution and control.	34
1045	Lake Creek	Current stocking rate is questionable. Livestock distribution and forage conditions need to be improved.	Monitoring studies need to be conducted to determine the proper stocking rate. Range improvements are needed to improve livestock distribution.	35
1044	Granny Peak	Current stocking rate is in question. Some evidence of overuse of some of the riparian areas.	Proper stocking rates need to be determined through monitoring studies. Water needs to be developed, and brush control is needed to improve livestock distribution and to improve forage conditions.	36

No.	Allotment Name	Resource Conflicts/Problems	Resource Management Objectives/ Opportunities	Priority Ranking
1026	Lost Creek	Improved livestock distribution required. May be a conflict between livestock and mule deer or elk winter range.	Need monitoring to determine proper stocking rates. Range improvements are needed to get better livestock distribution and control.	37
1027	Underwood	Improve livestock distribution. Improve range condition. Possible conflicts between livestock and big game for forage.	Need monitoring to determine proper stocking rates. Range improvements are needed to get better livestock distribution and control.	38
1447	Highway	Allotment has been historically used as a garbage dump. Evidence of unauthorized use by livestock.	Monitoring studies should be implemented to establish the proper stocking rate for the allotment. Dumping of trash on the allotment needs to be curtailed. Use supervision and unauthorized use detection should be done at a higher level.	39

APPENDIX A-7

GRAZING CAPACITY BY ALLOTMENT

Allot. No.	Allotment Name	Active Preference Use	5-Year Average Use	Surveyed Capacity AUMs 1/	Private AUMs	State AUMs	Other AUMs	Total
1001	Trespass Creek	144	144	144				144
1002	Inchauspe	1,396	751	1,396	725	355		2,476
1003	Hobble Creek	235	234	235				235
1004	Preacher Hollow	1,563	1,595	1,814	348	290		2,452
1005	Smiths Fork	13,979	11,845	18,945	3,982	3,165		26,092
1006	Reed	639	635	600	586	14		1,200
1007	Sawmill	269	267	297	280	213		790
1009	Erwin Creek	192	198	192	215	1,156		1,563
1010	Poison Creek	2,649	2,503	2,649	1,807	544		5,000
1012	Boyd Hollow	441	401	441	623	37		1,101
1014	Christy Canyon	1,248	776	1,248	166	453		1,867
1015	Goblin Gulch	311	310	311				311
1016	South Lake	60	60	60				60
1017	Leefe	297	296	297	188	57		542
1018	Quealy Reservoir	125	124	125	56	75		256
1019	Chapel Creek	198	200	198				198
1020	Grade Creek	303	303	303				303
1021	Lund Draw	347	300	347				347
1022	Seizmore	43	43	43				43
1023	Stoner	28	28	28				28
1024	Ryan Creek	389	312	389	302	57		748
1025	Sublette Pasture	95	88	95	74	45		214
1026	Lost Creek	300	300	300		61	897	1,258
1027	Underwood	820	820	820	32			852
1029	Orr	262	205	262	108			370
1030	Pine Creek	312	243	312		75		387
1031	Sublette Canyon	364	108	364				364
1032	Hoodoo	450	156	450	21	97		568
1033	Tom Goure	545	288	545	913			1,458
1034	Slide Rock	212	203	212	130	119		461
1035	Rock Creek	8,838	8,616	9,244	1,064	1,793	1,166 2/	13,267
1036	Mayfield	126	386	126	1,982	296		2,404
1037	Wilkinson Creek	400	311	400	1,162			1,562
1038	Dempsey Basin	1,824	1,822	1,828	909	86		2,823
1039	Fish Creek	3,137	2,793	3,137	1,660	123		4,920
1040	Pole Creek	780	780	780	787	204		1,771
1041	East Fork	229	192	229				229
1042	Beaver Creek	2,209	1,828	2,209	176	380		2,765
1043	Commissary	511	511	511		113		624
1044	Granny Peak	122	124	122	188			310
1045	Lake Creek	549	542	549	419			968
1046	Trail Creek	1,070	992	1,149				1,149
1048	Qukenasp Canyon	658	455	658				658
1049	Westphal Creek	218	125	218	15			233
1050	Sawmill	240	159	240	74			314
1051	West Willow Creek	159	159	159	98			257
1052	Airport	335	68	335	116			451
1055	Curtis	25	25	25				25
1056	Moyer	87	0	87	99			186
1057	Larson	17	18	17				17
1101	Clear Creek	49	49	49	257			306
1102	Fontenelle Basin	4	4	4				4
1103	South Fontenelle	54	54	54	100			154
1104	Bartlett Creek	68	68	68	132			200
1105	Mammoth Hollow	757	518	757	442	109		1,308
1106	Everly Creek	87	46	87	66	158		311
1107	Pomeroy Basin	1,919	1,052	1,931	1,756	859		4,546
1108	Hood	17	6	17	63			80
1109	Colletti	134	136	134	113	19		266
1110	Quealy Peak	94	0	94	133			227
1111	Graham	57	32	57	129	45		231
1112	Seedsakadee	785	686	298			487	785
1113	Slate Creek	9,980	7,585	10,780	1,000	215	298	12,293
1201	Possil	58	59	58	48			106
1202	Albert Creek	2,252	1,028	2,307	2,000	100		4,407
1204	Border	24	24	24	96			120
1205	State Line	138	138	138	37			175
1206	Cumberland & Uinta	36,816	31,022	38,570	24,080	4,040		66,690
1207	Sage	5	5	5				5
1301	Cow Hollow	687	473	537	425	66		1,028
1302	Granger Lease	16,587	5,745	14,817	20,430	844		36,091
1303	Lyman Cattle	1,915	482	1,074	1,126	45		2,245
1304	Coyote Springs	167	165	167	260	46		473
1305	Hassett	116	116	116	172			288
1306	Carter Lease	13,280	7,660	13,154	16,699	945		30,798
1308	Monument	186	173	186	467	91		744
1310	South Monument	10	0	10				10
1311	Austin Place	30	30	30				30
1312	Austin Triangle	1,403	1,396	1,403	1,420	38		2,861
1313	Nipple	30	30	30				30
1314	Hamblin	44	44	44				44
1315	Oaks	37	37	37				37
1316	Upper Ranch	11	11	11	60			71
1317	Bridger Airport	2,477	2,121	2,809		698		3,507
1318	Bigelow	571	539	571	677	78		1,326
1319	Coal Mine Draw	158	94	158		219		377
1320	Leroy	759	740	759	801	20		1,580
1321	Nelson Section	20	20	20		80		100
1322	Opal	232	232	232	268			500
1323	Nutria Allotment	20	24	20		80		100
1324	Cottonwood Bench	1,748	488	2,258				2,258

Appendix A-7

Allot. No.	Allotment Name	Active Preference Use	5-Year Average Use	Surveyed Capacity AUMs 1/	Private AUMs	State AUMs	Other AUMs	Total
1325	Roberson Creek	130	85	130				130
1326	H. F. Allotment	36	36	36				36
1401	Toomer	2	2	2				2
1402	Fort Bridger	10	10	10				10
1403	Nebraska Flat	34	34	34				34
1404	Milburne	30	30	30				30
1405	Spring Creek	41	41	41				41
1406	Little Creek	330	333	330				330
1408	Poverty Flat	1,065	384	1,065				1,065
1409	Lower Bench	30	34	30				30
1410	Jackman	3	3	3				3
1411	Tipperary	4	4	4				4
1412	Gourley	45	45	45				45
1413	Leavitt Bench	402	418	402	245			647
1414	Cottonwood	120	0	120	120			240
1415	Sidehill	10	10	10				10
1417	Dry Creek Bench	60	60	60	33			93
1418	Bench	1,150	1,148	1,150	15			1,165
1419	Coyote Hollow	15	15	15				15
1420	Johnson	8	8	8				8
1421	Smith	25	0	25				25
1422	Smitha Fork	100	100	100				100
1423	Murray Reservoir	200	200	200				200
1424	Graham Reservoir	55	55	55				55
1425	Timber Place	17	17	17				17
1426	Domingo	7	7	7				7
1427	Murray Ditch	30	30	30				30
1428	West Fork	180	90	180				180
1429	Thunderbolt	50	50	50				50
1430	Willow Creek	705	702	705	51			756
1431	Yellow Hollow Creek	78	79	78				78
1432	Wall	12	0	12				12
1434	Bond	42	0	42				42
1435	North Horse Creek	435	436	435				435
1436	Sage Chicken Flat	57	56	57				57
1437	South Horse Creek	360	361	360				360
1438	Horse Creek	125	125	125				125
1439	Crowfoot	6	6	6				6
1440	Bridger Butte	300	300	300	200			500
1441	Lower Cottonwood	476	477	476				476
1442	Crooked Canyon	466	331	466	54			520
1443	Rocky Springs	72	70	72				72
1444	Dutchy Hollow	28	30	28				28
1445	Hanna Johnson	40	40	40				40
1446	Quarry Creek	85	85	85				85
1447	Highway	96	96	96				96
1448	Fourty	23	23	23				23
1449	Sage Creek	452	454	452				452
1450	Dry Canyon	56	56	56				56
1451	Half Sec Horse Creek	31	30	31				31
1452	Upper Flat	182	185	182				182
1453	Wall Reservoir	45	45	45				45
1454	Upper Sage	1,450	1,412	1,450				1,450
1501	Medicine Butte	912	912	912				912
1502	Spring Canyon	167	168	167				167
1503	Rock House	481	480	481	1,189			1,670
1504	Crompton Reservoir	85	85	85				85
1505	Bryne Creek	284	284	284				284
1506	Valley Creek	256	255	256				256
1507	Heinsaw Creek	1,114	1,038	1,114				1,114
1508	Toma Draw	345	346	345				345
1509	Spring Hollow	228	228	228				228
1510	Haystack Draw	309	309	309	395			704
1511	Bigelow Ditch	80	80	80				80
1512	Meeks Cabin	642	667	685				685
1513	Gloascok Hollow	387	387	387				387
1514	Aapen	152	152	152				152
1515	Johnson	28	28	28				28
1516	Ouel	52	52	52				52
1517	Waaatch	72	96	72				72
1518	Coyote Creek	103	102	103				103
1519	Barker	21	21	21				21
1520	Yellow Creek	5	5	5				5
1521	The Broilera Drawl	235	235	235				235
1522	Eaat Branch	86	86	86				86
1523	Murphy Ridge	28	28	28				28
1524	Cook	28	20	28				28
1525	Blake Hollow	255	255	255				255
1526	Stowe Creek	85	84	85				85
1527	Hague Creek	80	80	80				80
1528	Guild Ranch	58	58	58				58
1529	Balaam Draw	43	43	43				43
1530	Stoney Run	25	25	25				25

Appendix A-7

Allot. No.	Allotment Name	Active Preference Use	5-Year Average Use	Surveyed Capacity AUMA ^{1/}	Private AUMs	State AUMA	Other AUMs	Total
1531	Sulphur Creek	38	38	38				38
1533	Grove	50	50	50				50
1534	Moslander Ranch	370	370	370				370
1535	Myers	904	904	904				904
1536	Sims Canyon	47	47	47				47
1537	Thomaa Canyon	71	70	71				71
1538	Turner	10	2	10				10
1539	Moss Creek	94	100	94				94
1540	Ring	11	11	11				11
1541	Ory Creek	9	9	9				9
1543	Stewart	88	0	88				88
1544	Cedar Creek	12	14	16				16
1545	Smith Canyon	43	27	43				43
1546	Herman Canyon	27	0	27				27
1547	Salt River	14	14	14				14
1548	Hemmert Lease	64	64	64				64
1549	Heiner Lease	16	16	16				16
1550	Willow Creek	16	16	16				16
1551	Dutson Canyon	16	0	16				16
1553	Graveyard Canyon	8	8	8				8
1554	Wickup Knoll	60	0	55				55
1556	Crow Point	16	16	16				16
1557	Crow Creek	16	16	16				16
1559	Spring Creek	50	50	50				50
1560	Smith Lease	8	7	8				8
1561	Johnson Lease	8	8	8				8
1562	East Fork Creek	64	64	64				64
1563	Cedar	14	14	14				14
1564	Section 33 Lease	11	11	11				11
1565	Ory Canyon	20	20	20				20
1566	Merritt	4	4	4				4
1567	Brown	9	9	9				9
1568	Ralon	12	12	12				12
Total		161,967	123,788	167,793	94,706	18,603	2,848	283,950

^{1/} Date of source: 1966 Range Survey

^{2/} AUMA in Fossil Butte National Monument which will be withdrawn from grazing use after 1985.

APPENDIX A-8

LAND OWNERSHIP BY ALLOTMENT
Sections 3 & 15 of Taylor Grazing Act

Allot. No.	Allotment Name	Federal Acres	Private Acres	State Acres	Other Acres	Total
1001	Trespaas Creek	1,080				1,080
1002	Inchauspe	4,123	1,449	711		6,283
1003	Hobble Creek	1,929				1,929
1004	Freacher Hollow	8,259	1,812	981		11,052
1005	Smiths Fork	64,725	14,627	11,585		90,937
1006	Reed	2,119	1,841	42		4,002
1007	Sawmill	1,197	677	519		2,393
1009	Erwin Creek	792	456	2,446		3,694
1010	Poison Creek	11,154	8,094	2,436		21,684
1012	Boyd Hollow	4,010	2,710	160		6,880
1014	Christy Canyon	9,042	408	1,120		10,570
1015	Goblin Gulch	2,845	1,583			4,428
1016	South Lake	323	2,207			2,530
1017	Leefe	2,263	1,777	342		4,382
1018	Quealy Reservoir	581	331	602		1,514
1019	Chapel Creek	2,079				2,079
1020	Grade Creek	2,555				2,555
1021	Lund Draw	2,303				2,303
1022	Seizmore	260	257			517
1023	Stoner	80	818			898
1024	Ryan Creek	2,347	1,914	364		4,625
1025	Sublette Pasture	195	348	159		702
1026	Lost Creek	2,134	61	897		3,092
1027	Underwood	4,320	160	1,121		5,601
1029	ORR	1,642	878			2,520
1030	Pine Creek	3,175	640			3,815
1031	Sublette Canyon	1,829	834			2,663
1032	Hoodoo	2,776	142	640		3,558
1033	Tom Goure	3,329	2,603			5,932
1034	Slide Rock	1,445	1,349	600		3,394
1035	Rock Creek	60,784	7,113	13,301		81,198
1036	Mayfield	1,543	4,278	640		6,461
1037	Wilkinson Creek	2,610	5,633			8,243
1038	Dempsey Basin	11,361	3,861	640		15,862
1039	Fish Creek	13,286	7,801	687		21,774
1040	Fole Creek	3,546	2,458	640		6,644
1041	East Fork	1,010				1,010
1042	Beaver Creek	7,840	592	1,280		9,712
1043	Commissary	4,318		1,280		5,598
1044	Granny Peak	1,932	982			2,914
1045	Lake Creek	2,621	2,067			4,688
1046	Trail Creek	6,904	160	578		7,642
1048	Quakenasp Canyon	6,643	1,203	640		8,486
1049	Westphal Creek	1,321	83			1,404
1050	Sawmill	1,124	397	320		1,841
1051	West Willow Creek	730	480			1,210
1052	Airport	4,918	493			5,411
1055	Curtia	120				120
1056	Moyer	553	435			988
1057	Larson	82				82
1101	Clear Creek	240	840			1,080
1102	Fontenelle Basin	40	891			931
1103	South Fontenelle	380	520			900
1104	Bartlett Creek	780	560			1,340
1105	Mammoth Hollow	9,945	3,715	1,266		14,926
1106	Everly Creek	994	467	1,120		2,581
1107	Pomeroy Basin	14,698	7,859	3,840		26,397
1108	Hood	120	280			400
1109	Colletti	786	645	108		1,539
1110	Quealy Peak	1,294	1,604			2,898
1111	Graham	744	1,446	603		2,793
1112	Seedskadee	5,318			7,237	12,555
1113	Slate Creek	229,365	30,227	5,697	5,881	271,170
1201	Fossil	320	240			560
1202	Albert Creek	16,418	21,004	1,600		39,022
1204	Border	203	871			1,074
1205	State Line	238	20			258
1206	Cumberland & Uinta	266,144	165,397	27,761		459,302
1207	Sage	40				40
1301	Cow Hollow	5,365	8,748	640		14,753
1302	Granger Lease	248,107	263,268	10,870		522,245
1303	Lyman Cattle	15,442	16,181	640		32,263
1304	Coyote Springs	2,998	4,424	640		8,062
1305	Hassett	1,970	2,775			4,745
1306	Carter Lease	118,114	131,745	7,454		257,313
1308	Monument	3,746	3,975	640		8,361
1310	South Monument	223				223
1311	Austin Place	640	4,718			5,358
1312	Austin Triangle	29,336	35,386	910		65,632
1313	Nipple	160				160
1314	Hamblin	340	148			488
1315	Oaks	160	495			655
1316	Upper Ranch	40	400			440
1317	Bridger Airport	20,757	11,529			33,226
1318	Bigelow	4,320	7,300	855		12,475
1319	Coal Mine Draw	2,304	3,120			5,424
1320	LeRoy	6,080	6,880	160		13,120
1321	Nelson Section	249	680			929
1322	Opal	2,382	1,481			3,863
1323	Nutria Allot.	300	770			1,070

APPENDIX A-8

Allot. No.	Allotment Name	Federal Acres	Private Acres	State Acres	Other Acres	Total
1324	Cottonwood Bench	23,257	1,802			25,059
1325	Roberson Creek	2,298	3,498			5,796
1326	H. F. Allot.	160	215			375
1401	Toomer	40	408			448
1402	Fort Bridger	200	3,387			3,587
1403	Nebraska Flat	600	4,065			4,665
1404	Milburne	240	183			423
1405	Spring Creek	450	8,241			8,691
1406	Little Creek	5,561	9,747			15,308
1408	Poverty Flat	7,570				7,570
1409	Lower Bench	857				857
1410	Jackman	83	292			375
1411	Tipplersry	42	392			435
1412	Gourley	2,209	547			2,756
1413	Leavitt Bench	4,893	1,419			6,312
1414	Cottonwood	755	597			1,352
1415	Slidehill	122	152			274
1417	Dry Creek Bench	332	281			613
1418	Bench	4,987	320			5,307
1419	Coyote Hollow	160	1,055			1,215
1420	Johnson	80	80	640		800
1421	Smith	323	320			643
1422	Smiths Fork	800	1,600			2,400
1423	Murray Reservoir	1,825	1,329			3,154
1424	Graham Reservoir	180	220			400
1425	Timber Place	160	171			331
1426	Domingo	80				80
1427	Murray Ditch	120	613			733
1428	West Fork	620	990			1,610
1429	Thunderbolt	152	717			869
1430	Willow Creek	3,708	478			4,180
1431	Yellow Hollow Creek	722	866	640		2,228
1432	Wall	80	140			220
1434	Bond	489	315			804
1435	North Horse Creek	2,485				2,485
1436	Sage Chicken Flat	796	672			1,468
1437	South Horse Creek	1,985				1,985
1438	Horse Creek	1,244	2,084			3,328
1439	Crowfoot	40	860			900
1440	Bridger Butte	1,324	1,794			3,118
1441	Lower Cottonwood	5,969	4,831			10,800
1442	Crooked Canyon	5,552	320			5,872
1443	Rocky Springs	209	80			289
1444	Dutchy Hollow	80	471			551
1445	Hanna Johnson	115	119			234
1446	Quarry Creek	1,448	658			2,106
1447	Highway	1,968	547			2,515
1448	Fourty	40				40
1449	Sage Creek	3,942	5,095			9,037
1450	Dry Canyon	1,800				1,800
1451	Half Section Horse Creek	320	220			540
1452	Upper Flat	1,240	1,011			2,251
1453	Wall Reservoir	690				690
1454	Upper Sage	15,061	720			15,781
1501	Medicine Butte	7,116	9,047	640		16,803
1502	Spring Canyon	988	1,559			2,547
1503	Rock House	3,315	8,600	1,280		13,195
1504	Crompton Reservoir	721	1,317			2,038
1505	Bryne Creek	2,552	6,516			9,068
1506	Valley Creek	1,821	3,313			5,134
1507	Heinssaw Creek	9,022	30,769			39,791
1508	Toms Draw	3,273	1,920			5,193
1509	Spring Hollow	2,074	5,577	640		8,291
1510	Haystack Draw	2,784	4,899			7,683
1511	Beigelow Ditch	640	3,207			3,847
1512	Meeks Cabin	6,604	12,971	1,280		20,855
1513	Glosscock Hollow	3,102	13,873	1,280		18,255
1514	Aspen	1,120	455			1,575
1515	Johnson	160	3,972			4,132
1516	Duel	320	1,634	640		2,594
1517	Wasatch	540	1,113			1,653
1518	Coyote Creek	935	14,338			15,273
1519	Barker	160	833			993
1520	Yellow Creek	35	757			792
1521	The Bolders Draw	1,760	6,309			8,069
1522	East Branch	640	1,301			1,941
1523	Murphy Ridge	286	83			369
1524	Cook	240	785			1,025
1525	Blake Hollow	2,032	4,894			6,926
1526	Stowe Creek	680	1,600	640		2,920
1527	Haque Creek	640	657			1,297
1528	Guild Ranch	630	1,219			1,849
1529	Balsam Draw	640	1,290			1,930
1530	Stoney Run	160	494			654
1531	Sulphur Creek	301	1,599			1,900
1533	Grove	320	2,553			2,873
1534	Moslander Ranch	2,403	10,903			13,306
1535	Myers	8,133	26,695	1,280		36,108
1536	Sims Canyon	400	301			701
1537	Thomas Canyon	636	1,304			1,940
1538	Turner	80		160		240
1539	Moss Creek	640	3,189			3,829

APPENDIX A-8

<u>Allot.</u> <u>No.</u>	<u>Allotment Name</u>	<u>Federal</u> <u>Acres</u>	<u>Private</u> <u>Acres</u>	<u>State</u> <u>Acres</u>	<u>Other</u> <u>Acres</u>	<u>Total</u>
1540	Ring	88	937			1,025
1541	Dry Creek	140				140
1543	Stewart	440	360			800
1544	Cedar Creek	200	540	20		760
1545	Smith Canyon	174	320			494
1546	Herman Canyon	80		320		400
1547	Salt River	80	320			400
1548	Hemmert Lease	320	240			560
1549	Heiner Lease	80	320			400
1550	Willow Creek	80	240	640		960
1551	Dutson Canyon	80	620			700
1552	Marthas Canyon	63	380			443
1553	Graveyard Canyon	120				120
1554	Wickup Knoll	273	380			653
1556	Crow Point	78	360			438
1557	Crow Creek	80	240	400		720
1558	Hardmans Hollow	29	180			209
1559	Spring Creek	200	560			760
1560	Smith Lease	48	748			796
1561	Johnson Lease	40	320			360
1562	East Fork Creek	320	624			944
1563	Cedar	200	720			920
1564	Section 33 Lease	160	320			480
1565	Dry Canyon	80	80			160
1566	Merritt	22	80			102
1567	Brown	45	120			165
1568	Ralon	100				100

APPENDIX A-9

RANGE USE & PERMITTEES BY ALLOTMENT Section 3

Allot. No.	Permittee	Gr. No.	Preference		5-Year Avg. Use	Livestock Class	Season	
			Active	Suspended			On	Off
1001	Larson, Melvin W.	4102	144	32	144	Cows	06-16	09-30
1002	Larson, Melvin W.	4102	113		83	Cows	06-16	09-30
1002	Chournos, Nick & Sam	4028	1,283		668	Sheep	05-15	10-31
1003	Thompson Land & Lvt	4161	235		234	Sheep	06-18	07-14
1004	Etchevery Brothers	4044	0	0	0	Cows	07-01	09-30
1004	Larson, Melvin W.	4102	253		252	Cows	06-01	09-30
1004	Mackey, Charles E.	4109	280		279	Cows	07-01	09-30
1004	Teichert Brothers	4157	15		11	Horses	05-16	10-15
			500		501	Cows	05-16	10-13
1004	Teichert, John A.	4192	12		14	Horses	06-01	09-30
			503		538	Cows	06-01	10-15
1005	Argyle Ranch Inc.	4005	1,425		1,311	Sheep	05-10	06-30
							10-11	10-31
1005	Bailey, Virgil	4008	265		263	Cows	05-16	09-30
1005	Bischoff, Ernest B.	4012	41		41	Cows	05-16	09-30
			140		140	Sheep	05-16	06-30
							09-16	10-15
1005	Boehme Brothers	4016	464		413	Cows	05-25	09-30
1005	John Boehme Sons	4017	95		96	Cows	06-01	09-30
1005	Carricaburu-Jaurequi	4027	405		214	Sheep	05-15	09-25
1005	Chournos, Nick & Sam	4028	1,105		870	Sheep	05-10	07-06
							09-20	10-31
1005	Bailey, Virgil*	4035	81		81	Sheep	06-15	09-30
1005	Larson, Stanley*	4039	639		556	Cows	05-16	09-30
					70	Sheep	10-15	11-25
1005	Eschler, Norman	4043	284		50	Cows	05-20	09-30
1005	Etchevery Brothers	4044	1,486		1,294	Cows	05-25	09-30
1005	Feuz Ranch	4054	1,630		1,603	Cows	05-20	09-30
1005	Hatch, Alvin	4072	318		Non-Use	Sheep	05-15	06-30
							09-25	10-31
1005	Hidalgo, Gerald	4078	195		155	Cows	05-25	09-30
1005	Hirschi, La Vall E.	4080	319	17	319	Cows	05-20	09-30
			7		7	Sheep	06-01	06-30
* 5-Year Average Use for one year only on sheep								
1005	Johns, Roland & Marilyn	4088	716		403	Cows	05-16	09-30
					194	Sheep	05-15	07-07
							09-10	10-20
1005	Loertcher, John H.	4104	542		483	Cows	05-25	09-30
1005	Price, Merlin	4131	113		90	Cows	05-16	09-30
1005	Roberts, L. W.	4138	145		102	Cows	05-25	09-30
			1,332		874	Sheep	05-05	06-30
							10-01	10-20
1005	Saxton, James & Mary	4141	125		125	Cows	05-16	09-30
1005	Teichert Brothers	4157	186		129	Cows	05-16	06-15
							07-01	09-30
1005	Teichert, Herman	4158	615		615	Cows	07-01	09-30
1005	Thompson Land & Lvt.	4161	113		113	Sheep	06-14	06-26
1005	Tueller Est., Louis O.	4168	558		466	Cows	05-16	09-30
					54	Sheep	05-10	06-30
1005	Wilde, Karl & Don	4178	226		Non-Use	Cows	05-16	05-31
					Non-Use	Sheep	06-01	09-15
1005	Bailey, Virgil	4182	265		263	Cows	05-16	09-30
1005	Teichert, John A.	4192	187		185	Cows	07-01	09-30
1005	Teuscher, Milton	4198	275		266	Cows	06-01	09-30
1006	Feuz Ranch	4134	639		635	Cows	05-20	10-10
1007	Clark, Lowell F.	4097	269		267	Cows	05-20	09-15
1009	Roberts, L.W.	4138	192		62	Cows	05-16	09-15
					119	Sheep	05-05	10-10
					17	Horses	05-16	09-15
1010	C & R Grazing Assn.	4031	2,649		2,503	Cows	06-01	10-15
1012	Thompson Land & Lvt.	4162	441	109	401	Cows	05-01	06-18
1014	Thompson Land & Lvt.	4193	1,248	292	589	Cows	04-25	06-24
					187	Sheep	05-01	05-31
							09-20	10-19
1015	Thornock Brothers	4163	311		310	Cows	05-16	07-15
1016	Putnam, Keith L.	4132	60	224	60	Cows	06-01	09-30
1017	Johnson Ranch	4090	297	33	296	Cows	05-10	07-09
1018	Cook, Oris K.	4032	125		124	Cows	06-01	07-31
1019	Mackey, Charles	4109	198	82	200	Cows	05-20	06-30
							10-01	10-15
1020	Seven C Ranch	4165	303	269	303	Cows	06-06	08-24
1021	Thornock, John R.	4108	347	329	116	Cows	06-01	09-30
					184	Sheep	06-01	10-10
1022	Thompson Land & Lvt.	4162	43		43	Cows	05-01	05-31
1023	Thompson Land & Lvt.	4162	28		28	Cows	05-01	05-31
1024	Pope, Evan	4029	389		312	Cows	05-20	08-19
1025	Larson, Glen	4100	95	25	88	Cows	06-01	09-30
1026	Larson, Glen**	4100	300		300	Cows	06-10	08-25
1027	Thompson Land & Lvt.	4161	225	15	225	Sheep	06-12	07-07
1027	Thompson Land & Lvt.	4162	595	103	569	Cows	05-05	05-31
1029	Thoman, Alfred	4160	262		205	Sheep	05-01	05-31
							06-21	06-26
							09-16	09-30
							10-11	11-14
1030	Thompson Land & Lvt.	4162	312	504	243	Cows	06-06	09-30
1031	Pope, Evan	4029	109	39	108	Cows	06-20	09-19
1031	Thompson Land & Lvt.	4161	255	90	Non-Use	Sheep	05-25	06-15
1032	Thompson Land & Lvt.**	4161	450	30	156	Sheep	06-06	06-14
							09-20	10-19

APPENDIX A-9

Allot. No.	Permittee	Gr. No.	Preference		5-Year Avg. Use	Livestock Class	Season	
			Active	Suspended			On	Off
1033	Thompson Land & Lvst.	4161	206	97	Non-Use	Sheep	09-20	10-19
1033	Thompson Land & Lvst.	4162	339	158	288	Cows	06-01	06-24
							09-21	09-30
1034	Larson, Glen**	4100	212		203	Sheep	06-01	09-29
1035	Cornia, Lloyd	4033	136	14	135	Cows	05-16	09-30
1035	Failoni, Mrs. Matt	4049	997	111	909	Cows	05-16	09-30
1035	Feller, Allen & Irene	4050	357	39	356	Cows	05-16	09-30
1035	Feller, Allen	4051	116	13	168	Cows	05-16	09-30
1035	Gunter, Rudy	4066	323	109	18	Horses	05-16	09-30
					306	Cows	05-16	09-30
1035	Julian Land & Lvst.	4092	169	18	65	Sheep	06-20	06-30
							09-20	10-19
1035	Failoni, Mrs. Matt	4120	171	117	171	Cows	05-16	09-30
1035	Peternal Brothers	4122	612	66	612	Cows	05-16	09-30
1035	Peterson, Raymond S.	4125	911	99	852	Cows	05-16	09-30
1035	Weston, Benjamin E.	4128	460	50	459	Cows	05-16	09-30
1035	Sedey, John	4144	176	19	176	Cows	05-16	09-30
1035	Thompson Land & Lvst.**	4161	2,223	241	2,210	Sheep	05-01	07-18
							09-20	10-19
** 5-Year Average Use for two years only								
1035	Thornock Brothers	4186	143	47	140	Cows	05-16	09-30
1035	Willis, Roland C.	4180	1,016	109	1,013	Cows	05-16	09-30
1035	Thornock Brothers	4163	1,028	112	1,026	Cows	05-16	09-30
1036	Thompson Land & Lvst.	4162	126	100	386	Cows	06-16	09-15
1037	Thornock Brothers	4194	400	80	311	Cows	06-16	09-30
1038	Antilla, Neillo & Walter	4004	206	96	207	Cows	06-01	09-15
1038	Carollo, Mary, Joe & George	4026	202	61	205	Cows	06-05	09-30
1038	Carollo, Mrs. Mary	4025	636	194	634	Cows	06-05	09-30
1038	Nate, Orson	4116	986	302	21	Horses	05-25	09-30
					962	Cows	05-25	09-30
1039	Bagley, Ross	4007	643	102	605	Cows	05-25	09-15
							07-01	09-15
1039	Buck, Chester E.	4020	173	88	173	Cows	05-25	09-30
1039	Dimond, Weldon	4040	908	144	890	Cows	06-04	09-15
1039	Thompson Land & Lvst.	4162	1,413	741	1,125	Cows	06-25	09-30
1040	Flying W Land & Lvst.	4057	780	732	780	Cows	06-01	09-30
1041	J. W. Ranching**	4121	229		192	Sheep	09-03	09-30
1042	Robinson, Arthur B.	4018	320	74		Sheep	06-01	10-05
1042	Hoffman, Roy D., et al.	4069	836	199	836	Cows	06-01	09-30
1042	Lozier, Robert E.	4106	1,053	251	992	Cows	06-01	09-30
1043	Big Sandy Green River	4011	511	49	511	Sheep	07-04	07-10
1044	Perentchak Ranch Inc.	4053	82		64	Cows	05-16	09-15
					20	Sheep	05-16	10-15
1044	Thoman, William J.**	4124	40		40	Sheep	06-01	07-12
1045	J. W. Ranching**	4121	549		542	Sheep	06-11	10-05
1046	Antilla, Neillo & Walter	4004	147	42	108	Cows	06-01	09-30
1046	Nate, Orson	4116	652	148	652	Cows	05-01	08-31
1046	Peternal Brothers	4122	418	78	340	Cows	05-16	10-15
1048	Bagley, Rosa	4007	538		195	Cows	05-25	12-31
					187	Sheep	03-25	08-31
							12-01	01-31
1048	Bagley, Rosa	4094	120		73	Sheep	02-01	02-28
							03-25	07-31
							12-01	12-13
** 5-Year Average Use for two years only								
1049	Bagley, Ross	4007	168	0	125	Sheep	04-01	05-05
			48	0	48	Cows	12-01	01-31
			6	0	6	Horses	05-16	07-16
1050	Bill Mau Sheep Company	4110	240		159	Sheep	05-01	07-31
							05-05	05-31
							09-21	09-26
1051	Thoman, William	4124	159	0	159	Sheep	07-01	07-27
1052	Krall, Joe	4098	255		Non-Use	Sheep	06-29	07-04
1052	Peternal Brothers	4122	80		68	Cows	05-16	09-30
1055	Seyen C Ranch	4165	25		25	Cows	05-01	09-30
1056	Thoman, William J.	4124	87	25	Non-Use	Sheep	06-21	06-30
1057	Larson, Melvin W.	4102	17		18	Cows	06-16	07-16
1101	Krall, Joe*	4098	49	77	49	Sheep	06-05	07-03
1102	Krall, Joe*	4098	4		4	Cows	06-01	09-30
1103	Bagley, Ross	4007	30		30	Cows	06-16	07-31
1103	Krall, Joe*	4098	24	38	24	Cows	06-01	09-30
1104	Bagley, Ross	4007	68	138	68	Sheep	06-01	09-30
1105	Harrower, Thomas S.	4070	757	833	462	Cows	05-05	09-30
					56	Horses	05-16	10-31
1105	Thoman, William J.	4124	0	0	Exc-Use	Sheep	06-26	07-12
1106	Harrower, Thomas S.	4070	87	72	46	Cows	05-05	09-30
1107	Larson, Arnold**	4030	92	5	93	Cows	07-01	09-30
1107	Harrower, Thomas S.**	4023	183		184	Cows	06-01	09-30
1107	Flying W Land & Lvst.	4057	92		Non-Use	Cows	06-01	09-30
1107	Julian Land & Lvst.	4092	337	25	134	Sheep	11-01	11-10
							05-01	06-30
1107	Bill Mau Sheep Company	4110	1,128		553	Sheep	05-16	10-12
1107	Peternal Brothers	4122	87		88	Cows	05-16	09-15
1108	Harrower, Thomas S.	4023	17	11	184	Cows	06-01	09-30
1109	Larson, Arnold	4099	134	133	126	Cows	06-01	08-31
1110	Duthie, Theodore	4041	94	7	Non-Use	Sheep	07-16	09-30
1111	Big Sandy Green River	4011	57		32	Sheep	05-01	10-15
1112	Thoman, William J.	4124	785	590	48	Sheep	05-01	05-31
					378	Cows	10-01	12-15
							05-01	06-30

* 5-Year Average Use for one year only

** 5-Year Average Use for two years only

APPENDIX A-9

Allot. No.	Permittee	Gr. No.	Preference		5-Year Avg. Use	Livestock Class	Season	
			Active	Suspended			On	Off
1112	Thoman, William J.	4124	785	590	389	Cows	07-01	09-20
					260	Sheep	05-15	12-31
1113	Big Sandy Green River	4011	4,344		3,780	Sheep	04-26	11-30
1113	Harrower, Thomas S.*	4023	1,468	132	1,468	Cows	05-08	10-31
1113	Davison, Margaret R.	4038	77	6	Non-Use	Sheep	05-01	05-31
							10-06	10-31
1113	Duthie, Theodore	4041	94	7	Non-Use	Sheep	06-01	07-15
1113	Gunter, Rudolph	4066	134	10	Non-Use	Sheep	05-20	07-15
							09-29	10-09
1113	Harrower, Thomas S.	4070	3,187	1,056	1,680	Cows	05-08	10-31
1113	Krall, Joe	4098				Cows	06-01	09-30
1113	Larson, Arnold	4099	657		657	Cows	05-16	09-30
1113	Thoman, William J.	4124	19		Exc-Use	Sheep	06-26	06-28
1201	Lewis Ranch	4103	58		59	Cows	05-01	10-31
1202	Broadbent, J.R.	4190	1,521	448	1,028	Sheep	05-01	06-20
							10-10	11-30
1202	Broadbent, J.R.**	4191	731	289	No Use	Cows	05-01	09-30
					Since '79		11-16	12-31
1204	Brown, Mariner S.	4019	24		24	Sheep	05-01	06-15
1205	Brown, Mariner S.	4019	138	37	138	Cows	05-10	06-30
1206	Argyle Ranch Company	4001	987		938	Cows	05-09	10-15
1206	Aimone, Marion	4003	290	87	290	Cows	05-16	10-15
1206	Beet River Land & Grazing	4009	2,032	601	2,030	Cows	05-01	09-30
1206	Big Sandy & Green River	4011			Exc-Use	Sheep	05-27	06-25
							07-01	08-31
1206	Cornia, William D.	4034	90	84	90	Cows	05-01	10-15
1206	Kennedy, William*	4036	100	16	100	Cows	05-01	09-30
1206	Ellis, Silas	4042	1,122	913	778	Cows	05-01	10-15
1206	Falloni, Mrs. Matt	4049	117		100	Cows	05-01	09-30
1206	Francis S. & Sons Co.	4058	101		80	Cows	05-16	10-15
1206	Kennedy, William	4071			Exc-Use	Cows	05-01	10-15
1206	Hatch, Dale	4073	450	167	450	Cows	05-01	10-15
1206	Hatch Land & Lvst.	4074	1,040	440	1,043	Cows	05-01	10-15
* 5-Year Average Use for one year only								
** 5-Year Average Use for two years only								
1206	Hebdon, Viri	4075	1,129	334	895	Sheep	04-25	07-15
							09-15	11-28
1206	Hopkins, Vern J.**	4082	63	89	61	Cows	05-01	10-15
1206	Jackson Land & Lvst.	4085	2,945	1,275	2,883	Cows	05-01	10-15
1206	Jackson, Lorain	4086	1,305	570	1,305	Cows	05-01	10-15
1206	Johnson Ranch	4090	316	134	316	Cows	05-16	10-15
1206	Jones, David L.	4091	160	89	160	Cows	05-01	10-15
1206	Julian Land & Lvst.	4092	2,866	1,173	1,542	Sheep	05-01	10-20
1206	Kennedy, Sheldon	4095	40	20	40	Cows	05-01	10-15
1206	Kennedy, Wayne	4096	40	20	40	Cows	05-01	10-15
1206	Lewis Ranch	4103	667	248	35	Horses	05-01	11-30
					416	Cows	05-01	12-31
1206	Bill Mau Sheep Company	4110	306	90	214	Sheep	05-05	06-30
							09-21	11-15
1206	Painter & Company Inc.	4119	309	91	200	Sheep	04-26	05-31
							10-14	10-31
							11-26	11-30
1206	J. W. Ranching	4121	444	132	282	Sheep	05-01	06-30
1206	Thoman, William	4124	1,357		Non-Use	Sheep	05-01	10-31
1206	Redden Land & Lvst.	4133	1,148	340	497	Sheep	05-01	07-15
							10-01	11-30
1206	Rees Land & Lvst. Co.	4135	3,575	1,543	3,219	Cows	05-01	10-15
1206	Rex, Charles W. & Sterling	4136	370	125	370	Cows	05-01	10-15
1206	Rex, Charles W.	4137	40	55		Cows	05-15	09-15
						Sheep	12-01	12-20
1206	Schulthess, Wallace	4143	270	125	270	Cows	05-01	10-15
1206	Sims, Richard	4145	31	9	106	Cows	05-16	10-15
1206	Sims, Richard	4147	688	204	963	Cows	05-01	11-15
1206	Sims, Richard	4148	374	110	378	Cows	05-01	10-15
1206	Stuart, Dean M.	4152	85	38	85	Cows	05-01	10-15
1206	Telford, Roger	4159	400	135	400	Cows	05-01	10-15
1206	Thompson Land & Lvst.**	4161	1,702	489	1,406	Sheep	04-25	07-13
							09-20	10-19
1206	Thornock, Kay	4164	515	170	515	Cows	05-01	09-15
1206	Uinta Lvst. & Grazing	4170	2,866	1,015	2,866	Cows	05-01	10-15
1206	J. W. Ranching Company	4175	2,630	879	2,589	Cows	05-01	10-15
** 5-Year Average Use for two years only								
1206	Diamond W Ranching	4179	735	189	701	Cows	05-01	10-15
1206	Thornock Brothers	4186	720	317	716	Cows	05-16	09-30
1206	Broadbent, J.R.**	4190	1,580	468	596	Sheep	05-01	06-15
1206	Uinta Land & Grazing	4195	811	243	1,057	Cows	05-16	10-15
1207	O'Neill, Ted	4118	5		5	Cows	05-01	09-30
1301	Harrower, Thomas S.**	4023	473	81	473	Horses	05-16	10-31
						Cows	05-07	06-15
1301	Flying W Land & Lvst.	4057	214	53	Non-Use	Cows	05-01	05-31
1302	Argyle Ranch Inc.	4005	1,288	227	755	Sheep	03-01	04-30
							12-01	02-28
1302	Lozier, Robert E.	4105	1,291	323	226	Cows	12-01	04-30
1302	Lozier, Robert	4105	1,291	323	Non-Use	Sheep	12-01	04-30
1302	Powers, Victor	4130	1,472	367	526	Sheep	12-01	04-30
1302	Uinta Development Co.**	4169	205	50	204	Cows	05-01	10-31
1302	Broadbent, J.R.	4190	10,108	2,527	3,104	Sheep	12-01	04-30
1302	Broadbent, J.R.**	4191	932	199	930	Cows	05-01	10-31
1303	Eyre, Clem & Son	4045	499		No Use	Cows	05-10	10-31
					Since '76			

APPENDIX A-9

Allot. No.	Permittee	Gr. No.	Preference		5-Year Avg. Use	Livestock Class	Season	
			Active	Suspended			On	Off
1303	Eyre, John L.	4046	618		No Use Since '79	Cows	05-12	10-25
1303	Gross, Delmar	4063	258	60	241	Cows	05-01	10-31
1303	Gross, Ronald K.	4064	258	60	241	Cows	05-01	10-31
1303	Eyre, George R.	4126	282	45		Cows	05-16	09-30
1304	Larson, Arnold	4099	167	433	165	Cows	05-01	07-15
1305	Flying W Land & Lvst.	4057	116	74	116	Cows	05-01	05-31
1306	Julian Land & Lvst.	4092	576	144	619	Sheep	12-01	04-30
1306	Aimone, Marion	4003	190	50	190	Cows	05-16	10-15
1306	Bluemel, Robert L.	4014	234	46	234	Cows	05-10	10-31
1306	Duthie, Theodore Est.	4041	720	288	Non-Use	Sheep	12-01	04-30
1306	Frazier, Francis	4059	288	72	128	Sheep	12-01	04-30
1306	Larson Livestock Inc.	4101	1,728	432	937	Sheep	12-01	04-30
1306	McCulloch, Royer L.	4111	255	45	174	Cows	05-15	09-14
* 5-Year Average Use for one year only								
** 5-Year Average Use for two years only								
1306	Painter & Co. Inc.	4119	727	182	273	Sheep	12-01	04-30
1306	Powers, Victor	4130	1,152	288	442	Sheep	12-01	04-30
1306	Redden Land & Lvst.**	4133	2,644	661	348	Cows	05-01	10-15
					1,670	Sheep	12-01	04-30
1306	Sims, Ronald L. & Sons	4149	864	216	426	Sheep	12-01	04-30
1306	Tripp, William H.	4166	181	45	180	Cows	05-01	10-31
1306	Vercmak, Mrs. Steve	4171	92	16	Non-Use	Cows	05-01	10-31
1306	Sutton, Ralph	4184	576	174	Non-Use	Sheep	12-01	04-30
1306	Thoman, Alfred	4185	288	72	70	Sheep	12-01	04-30
1306	Broadbent, J.R.	4190	2,592	648	1,892	Sheep	12-01	04-30
1306	Larson Livestock Inc.	4199	173	43	77	Sheep	12-01	04-30
1308	Powers, Victor	4129	186		173	Sheep	04-20	06-10
1310	Powers, Victor	4129	10		10	Sheep	05-01	06-15
1311	Isom, D. J.	4084	30		30	Cows	06-01	08-30
1312	Broadbent, J.R.	4190	778	194	771	Cows	05-16	10-15
						Sheep	12-01	06-30
1312	Broadbent, J.R.**	4191	625	97	625	Cows	05-16	10-15
1313	Feiro, Kenneth	4056	30		30	Cows	05-16	10-15
1314	Isom, D.J.	4084	44		44	Cows	06-01	09-30
1315	Isom, D.J.	4084	37		37	Cows	06-01	10-05
1316	Poisnini, Gino	4052	11		11	Cows	03-01	02-28
1317	Giorgis, Ernest	4060	319	55	296	Cows	05-01	10-15
1317	Larson Livestock	4101	1,372	238	1,256	Sheep	05-01	07-05
							09-19	11-30
1317	Micheli Herford	4112	255	45	258	Cows	05-01	10-31
1317	Fraughton & Sweat	4115	531	94	311	Cows	05-01	09-30
1318	Broadbent, J.R.	4190	188	41	154	Sheep	05-01	06-30
1318	Broadbent, J.R.**	4191	383	96	385	Cows	05-16	10-15
1319	Painter & Company, Inc.	4119	158		94	Sheep	06-01	07-04
							11-17	11-25
1320	Micheli Herford	4112	759	254	740	Cows	05-01	10-31
1321	Calhoun, John N.	4022	20		20	Cows	05-16	07-15
1322	Lozier, Robert	4105	232		232	Cows	05-01	05-31
1323	Harrower, Thomas S.**	4023	20		24	Cows	05-01	05-25
** 5-Year Average Use for two years only								
1324	Eyre, Clem & Son	4045			No Use Since '76	Cows	05-10	09-30
1324	Eyre, John L.**	4046	404		286	Cows	05-10	10-31
1324	Gross, Delmar	4063	106	26	101	Cows	05-01	10-31
1324	Gross, Ronald K.	4064	106	26	101	Cows	05-01	10-31
1324	Larson Livestock Inc.	4101	578		Non-Use	Sheep	11-01	11-30
1324	Eyre, George R.	4126	122		122	Cows	05-16	09-30
1324	Wadsworth, Glen T.	4172	432		Non-Use	Sheep	11-01	02-28
1325	Larson, Arnold	4099	130		85	Cows	05-16	07-31
1326	Broadbent, J.R.	4191	36		36	Cows	05-16	06-30
1401	Stevens, Angus	4151	2		2	Cows	05-01	06-30
1402	Aimone, Felix & Marion	4002	10		10	Cows	05-01	06-30
1403	Stevens, Angus	4151	34	78	34	Cows	05-01	09-30
1404	Cantlin, John	4024	30	10	30	Cows	05-01	10-31
1405	Broadbent, J.R.	4190	41		41	Sheep	05-01	05-31
1406	Guild Ranch	4065	162	18	165	Cows	05-16	09-30
1406	Smith, Florence	4150	85	15	86	Cows	05-25	07-24
1406	White, Morton B.	4181	85	15	85	Cows	05-20	06-19
1408	Lamb, Jack & Garnet	4156	338		150	Cows	05-15	10-01
1408	Tanner, Raymond	4187	547		200	Cows	05-16	10-15
						Sheep	12-01	03-31
1408	Larson Livestock Inc.**	4199	180		34	Sheep	05-01	05-20
							11-18	11-25
1409	Larson Livestock Inc.**	4199	30		34	Sheep	07-01	07-29
1410	Taylor, Eugene C.	4155	3	7	3	Cows	09-01	09-30
1411	Troughton, John D.	4167	4	6	4	Cows	05-16	09-15
1412	Taylor, Eugene C.	4155	45	38	45	Cows	06-01	10-31
1413	Roitz, Felix L.	4139	402		418	Cows	06-01	10-31
1414	Dalquist, Oscar W.	4037	120		Non-Use	Cows	05-16	09-15
1415	Taylor, Eugene C.	4155	10	40	10	Cows	06-01	10-31
1417	Polson, Carl Clyde	4127	60		60	Horses	06-16	10-15
						Cows	05-16	10-15
1418	Beach Ranches Inc.	4010	330		330	Cows	05-16	10-31
1418	Polson, Carl Clyde	4127	202		202	Cows	05-16	10-31

** 5-Year Average Use for two years only

APPENDIX A-9

Allot. No.	Permittee	Cr. No.	Preference		5-Year Avg. Use	Livestock Class	Season	
			Active	Suspended			On	Off
1418	Stringer, Myron C.	4153	309		308	Cows	05-16	09-15
1418	Tsnner, Raymond A.	4154	309		308	Cows	05-16	10-15
1419	Johnson, Larry K.	4089	15	15	15	Cows	05-16	10-15
1420	Brough, Monte J.	4183	8	7	Non-Use	Cows	07-01	08-30
1421	Brough, Monte J.	4183	25	33	Non-Use	Cows	05-16	09-20
1422	Hickey, Robert	4079	100	100	100	Cows	05-01	09-30
1423	Walker, Ronald	4174	200	211	200	Cows	06-10	06-30
							08-16	10-15
						Sheep	05-10	06-30
							08-16	10-15
1424	Beach Ranches Inc.	4010	55		55	Cows	05-16	10-31
1425	Polson, Carl Clyde	4127	17	10	17	Cows	06-16	07-15
1426	Bryne, Charles & Bonnie	4006	7		7	Cows	07-16	08-15
1427	Almone, Felix & Marion	4002	30	5	30	Cows	06-01	08-31
1428	Peterson, David Jr.	4123	180		90	Cows	05-16	10-31
1429	Johnson, Larry K.	4089	50		20	Cows	06-01	06-30
					30	Sheep	06-01	06-30
1430	Hamilton, Richard	4068	608	606	608	Cows	06-01	09-30
1430	Henry, Maurice	4076	79	79	63	Cows	06-15	08-30
					13	Horses	06-15	08-30
1430	Wilcox, Leonard T.	4177	18	17	18	Cows	06-01	06-30
1431	Bird, Vearl & Patsy	4013	78	102	79	Cows	05-16	10-15
1432	Brough, Monte J.	4183	12		Non-Use	Cows	06-16	09-15
1434	Bond, Laurence	4173	42	58		Cows	06-01	08-31
1435	James, David A. & Son	4087	435	116	436	Cows	05-20	09-30
1436	Whittaker, Bern	4176	57	123	56	Cows	05-25	07-31
1437	Schell, William II	4142	360	359	361	Cows	06-05	09-30
1438	Robert Byrne Estate	4021	125	205	125	Cows	05-15	10-15
1439	Bird, Vearl & Patsy	4013	6		6	Cows	05-16	10-15
1440	Bluemel, Reed W.	4015	300		300	Cows	06-01	09-30
1441	Wadsworth, Glen T.	4172	476	1,060	477	Cows	05-15	11-30
1442	Hooten, David C.	4081	66		64	Cows	05-16	09-15
1442	Larson Livestock Inc.*	4199	400		267	Sheep	05-21	06-30
							11-26	11-30
* 5-Year Average Use for one year only								
1443	Rinker, Betty	4077	72		70	Cows	05-16	10-15
1444	Rinker, Betty	4077	28		30	Cows	05-16	10-15
1445	Rinker, Betty	4077	40		40	Cows	05-16	10-15
1446	Powers, Victor	4129	85		25	Horses	05-01	09-30
					60	Sheep	05-01	06-15
1447	Powers, Victor	4129	96		96	Sheep	05-01	06-15
1448	Miller, Mrs. Calen	4113	23		23	Cows	05-01	09-30
1449	Wadsworth, Glen T.	4172	452		454	Cows	05-15	10-31
1450	Tanner, Raymond	4154	56		56	Cows	05-15	10-14
1451	James, David & Son	4087	31		30	Cows	07-01	09-30
1452	Tsnner, Raymond A.	4187	182		125	Cows	05-16	10-15
					60	Sheep	06-01	06-30
							08-01	08-31
							10-01	10-31
1453	Larson Livestock Inc.	4101	45		45	Cows	05-01	09-30
1454	Wadsworth, Glen T.	4172	1,450	318	1,412	Cows	05-05	10-31
4012	Broadbent, J.R.	4190	6,295	1,573		Sheep	11-01	06-15
4021	Broadbent, J.R.	4191	162	38	Not-Sched.			
Section 15								
1501	Sims, Richard	4281	912		912	Cows	05-16	10-15
1502	Sims, Richard	4283	167		168	Cows	06-01	09-30
1503	Uinta Lvst. Crazing	4289	481		480	Cows	05-16	10-15
1504	Crompton, William	4243	85		60	Cows	05-01	06-15
							10-15	11-15
					25	Sheep	05-01	06-15
							10-15	11-15
1505	Sims, Michael J.	4284	284		84	Cows	05-01	08-31
					200	Sheep	05-01	08-31
1506	Faddis, Annie	4245	256		255	Cows	06-01	08-31
1507	Broadbent, J.R.	4233	1,114		342	Cows	06-01	11-30
					696	Sheep	05-01	06-30
							10-01	11-30
1508	Broadbent, J.R.	4234	345		346	Sheep	05-01	06-30
							10-01	11-30
1509	Painter & Company	4273	228		228	Cows	06-01	09-30
						Sheep	06-01	09-30
1510	Painter & Company	4273	309		309	Sheep	06-01	08-31
1511	Bugas, George & Susie	4237	80		80	Cows	06-01	09-30
1512	South Uinta Cattle	4286	642		667	Cows	05-01	09-30
1513	Powers, Victor	4275	387		387	Sheep	06-01	08-31
1514	Lyn, Joseph & Carl	4264	152		152	Sheep	06-01	09-30
1515	Johnson, Milton L.	4258	28		28	Cows	05-20	10-10
1516	Jamieson, Alex & Zel	4256	52		52	Cows	06-01	09-30
1517	Nixon, Rulon	4272	72		96	Cows	05-08	09-07
1518	Anschultz Land & Lvst.	4227	103		36	Cows	05-01	10-31
					66	Sheep	05-01	10-31
1519	Barker, Dewayne	4231	21		9	Cows	06-01	08-31
					12	Sheep	06-01	08-31
1520	Bountiful Livestock	4232	5		5	Sheep	06-01	06-30
1521	Redden Land & Lvst.	4277	235		35	Cows	06-01	10-31
					200	Sheep	06-01	10-31
1522	Circle Diamond Ranch	4238	86		86	Cows	06-01	07-30
1523	Sims, Richard	4282	28		28	Cows	06-01	09-30
1524	Cook, James H.	4240	28		20	Cows	06-01	09-30
					8	Sheep	06-01	09-30

APPENDIX A-9

Allot. No.	Permittee	Gr. No.	Preference		5-Year Avg. Use	Livestock Class	Season	
			Active	Suspended			On	Off
1525	Cook Sheep Company	4241	255		255	Sheep	06-01	08-31
1526	Cornelison, Dennis H.	4242	85		46	Cows	06-01	09-30
					38	Sheep	06-01	09-30
1527	Goodrick, Goe & Math	4247	80		80	Cows	06-01	07-31
1528	Guild Ranch	4248	58		58	Cows	07-01	08-31
1529	Bugss, Lawrence	4255	43		43	Cows	07-16	09-30
1530	Lowham, Wesley S.	4263	25		20	Cows	05-01	09-30
					5	Sheep	05-01	09-30
1531	Lester, Sylvester	4262	38		19	Cows	05-16	08-15
					19	Sheep	05-16	08-15
1533	Praughton & Sweet	4267	50		50	Cows	05-01	10-31
1534	Moslander, Harold*	4268	370		370	Cows	05-01	09-30
1535	Myers Land & Lvat.	4269	904		900	Cows	06-01	09-30
					4	Sheep	06-01	06-30
* 5-Year Average Use for one year only								
1536	Pierce, Roger	4274	47		30	Cows	06-01	08-31
					17	Sheep	06-01	08-31
1537	Saxton, Harold J.	4278	71		70	Cows	06-01	10-31
1538	Turner, David	4288	10		2	Sheep	06-01	06-30
					8	Cows	06-01	06-30
1539	Powers, Victor	4276	94		100	Sheep	06-21	07-01
							09-10	09-11
1540	Sessions, Elwin	4280	11		11	Cows	05-01	05-31
1541	Brown, M. W.	4235	9		9	Cows	06-01	08-31
1543	Clark, Marcus J.	4239	88		Non-Use	Sheep	06-01	09-30
1544	Hebdon, Viri	4250	12		14	Sheep	06-01	09-30
1545	Larson, Mark S. & Jo	4261	27		27	Cows	05-16	08-15
1546	Skinner, Edward T.	4285	27		Non-Use	Cows	06-01	08-31
1547	Nield, Ben, Rollo, & Ross	4270	14		14	Cows	06-01	07-31
1548	Hemmert, Wilford N.	4254	64		64	Cows	06-01	09-30
1549	Heiner, Glenn W.	4251	16		16	Cows	06-01	09-30
1550	Heiner, Ralph	4253	16		16	Cows	07-01	09-30
1551	Anderson B. & Hurd	4226	16			Cows	06-01	09-30
1552	Miles, O'Neil	4266	29		29	Cows	06-01	06-30
1553	Prome, Ted C.	4246	8		8	Cows	06-01	07-31
1554	Taylor, Merrill C.	4287	60		Non-Use	Sheep	05-16	06-30
1556	Roskie, Roderick	4229	16		16	Sheep	06-01	09-30
1557	Bagley, Lorain J.	4230	16		16	Sheep	06-01	09-30
1558	Phillips, Donald	4228	3		3	Cows	06-01	08-31
1559	Harmon, Orson Willis	4249	50		50	Sheep	06-01	07-31
1560	Wilkes, E. Nord	4290	8		7	Cows	05-01	11-30
1561	Johnson, L. A.	4259	8		4	Cows	06-01	06-30
					4	Sheep	06-01	06-30
1562	William Johns Estate	4257	64		64	Cows	06-01	09-30
1563	Crook, Harvey O.	4244	14		14	Sheep	06-01	10-31
1564	Lancaster, Dennis W.	4260	11		5	Cows	06-01	06-30
					6	Sheep	06-01	06-30
1565	Heiner, Lloyd	4252	20		20	Cows	06-01	09-30
1566	Merritt, Lamont R.	4265	5		4	Cows	06-01	10-15
1567	Brown, Othello	4236	9		9	Cows	06-01	09-30
1568	Ralon, Victor A.	4291	12		12	Cows	06-16	10-15

APPENDIX A-10

EXISTING RANGE IMPROVEMENTS

Allot. No.	Allotment Name	Fence (mi.)	Pipe-line (mi.)	Springs	Reservoirs	Cattle-guards	Exclosures	Corrals	Wells	Seedings (acres)	Brush Control (acres)
1002	Inchauspe	2									
1003	Hobble Creek	0.5									
1004	Preacher Hollow	0.5									80
1005	Smiths Fork	5				1	4	1			23,122
1006	Reed	11			1						400
1010	Poison Creek	30	2	1	4					3	510
1012	Boyd Hollow			1	2						1,000
1014	Christy Canyon	9		9		1					5,695
1017	Leefe				2				1		
1020	Grade Creek				2						
1021	Lund Draw	2									
1022	Seizmore	7									
1025	Sublette Pasture	2									
1026	Lost Creek	5									
1027	Underwood	2		1							
1029	Orr	6	1	1	2	1					
1030	Pine Creek									20	
1032	Hoodoo	2			1						
1033	Tom Goure	3									
1035	Rock Creek	31.5	6	20	26	5	3		2	461	1,760
1037	Wilkinson Creek	10									
1038	Dempsey Basin	23.5		1	6	4					
1039	Piah Creek	28	11								8,875
1041	East Fork				2						
1042	Beaver Creek	19		1							1,520
1043	Commissary	2									
1044	Granny Peak	4									
1046	Trail Creek				1						
1048	Quakenasp Canyon	9		2					1		
1049	Westphal Creek	5			3						
1050	Sawmill	3									
1052	Airport			1							
1056	Moyer	4			1						
1105	Mammoth Hollow	4									
1107	Pomeroy Basin	19									
1110	Quealy Peak	11									
1113	Slate Creek	29		1	94	12			11		
1202	Albert Creek	28				1	2				
1206	Cumberland/Uinta	11	2	17	121	1	2		3	120	
1302	Granger Lease	110				6			1		
1303	Lyman Cattle	20		5	6						
1304	Coyote Springs	18								100	
1305	Hassett	7									
1306	Carter Lease								1		
1312	Austin Triangle										
1317	Bridger Airport			1	6				2		
1318	Bigelow				1				1		
1320	Leroy	21		1	5	1					
1322	Opal	4									
1324	Cottonwood Bench	12			4	1					
1325	Roberson Creek	8									453
1405	Spring Creek	2									
1408	Poverty Plat	15									
1410	Jackman	4									
1412	Gourley	11									
1413	Leavitt Bench	24									
1414	Cottonwood	6									
1417	Dry Creek Bench	7.5									
1418	Bench	16		1	2	1					
1422	Smiths Fork	2									
1423	Murray Reservoir	9.5			1						
1424	Graham Reservoir	5									
1425	Timber Place	2									
1427	Murray Ditch	4									
1428	West Fork	5									
1430	Willow Creek	17				2				570	
1431	Yellow Hollow Cr.	3									130
1435	North Horse Creek										1,000
1436	Sage Chicken Plat	3			1						
1437	South Horse Creek	6									
1438	Horse Creek	4									
1440	Bridger Butte	11		1	1			1			
1441	Lower Cottonwood	11									
1442	Crooked Canyon	3									
1443	Rocky Springs	1									
1444	Dutchy Hollow	1									
1445	Hanna Johnson	1									
1446	Quarry Creek	4			2						
1449	Sage Creek	5									
1452	Upper Flat	3									
1454	Upper Sage			2	3						
1508	Toms Draw	4									
1513	Glosscock Hollow				1						
1535	Myers	4									
1541	Dry Creek	3									
1548	Hemmert Lease			1							
1565	Dry Canyon	4									
1566	Merritt	1									
Grand Total		709	22	68	299	36	9	2	26	1,271	48,308

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STIPULATIONS - OIL AND GAS PROGRAM

Standard Stipulations For Oil and Gas Leases

1. All of the land in this lease is included in *recreation or special area, etc.*). Therefore, no occupancy or disturbance of the surface of the land described in this lease is authorized. The lessee, however, may exploit the oil and gas resources in this lease by directional drilling from sites outside this lease. If a proposed drilling site lies on land administered by the Bureau of Land Management, a permit for use of the site must be obtained from the BLM District Manager before drilling or other development begins.
2. No access or work trail or road, earth cut or fill, structure or other improvement, other than an active drilling rig, will be permitted if it can be viewed from the *(road, lake, river, etc.)*.
3. No occupancy or other activity on the surface of *(legal subdivision)* is allowed under this lease.
4. No occupancy or other surface disturbance will be allowed within _____ feet of the *(road, trail, river, creek, canal, etc.)*. This distance may be modified when specifically approved in writing by the District Manager, Bureau of Land Management.
5. No drilling or storage facilities will be allowed within _____ feet of *(live water, the reservoir, etc.)* located in *(legal subdivision)*. This distance may be modified when specifically approved in writing by the District Manager, Bureau of Land Management.
6. No occupancy or other surface disturbance will be allowed on slopes in excess of _____ percent, without written permission from the District Manager, Bureau of Land Management.
7. In order to *(minimize watershed damage, protect important seasonal wildlife habitat, etc.)* exploration, drilling, and other development activity will be allowed only during the period from _____ to _____. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the District Manager, Bureau of Land

Management.

8. In order to minimize watershed damage during muddy and/or wet period the District Manager, Bureau of Land Management, may prohibit exploration, drilling or other development. This limitation does not apply to maintenance and operation of producing wells.
9. The *(trail, road)* will not be used as an access road for activities on this lease.
10. To maintain esthetic values, all semi-permanent and permanent facilities may require painting or camouflage to blend with the natural surroundings. The paint selection or method of camouflage will be subject to approval by the District Manager, Bureau of Land Management.

Sage Grouse Habitat "No occupancy or other surface disturbance will be allowed within a 1,320-foot radius of the center of a sage grouse strutting ground (lek). No exceptions to this will be granted. In order to protect the nesting area around the strutting ground, exploration, drilling, and other development activity will be allowed within a 1 ¼-mile distance from the ¼-mile lek protection zone only during the period June 15 to March 1. Exceptions to the monthly limitations in any year may be specifically authorized in writing by the District Manager, Bureau of Land Management."

Conditions for ADPs

1. The top _____ inches of topsoil will be stripped and stockpiled. This will amount to approximately _____ cubic yards of material which will be stockpiled.

The operator is responsible for establishing an acceptable stand of vegetation. The seed mix, based on pure live seed, will be as follows:

Seed should be planted after September 1 and prior to ground frost, or seed should be planted after the frost has left and before May 15.

Fall seeding is best. All seed must be drilled

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on the contour at a depth of ¼ to ½ inch. Slopes too steep or rocky for machinery can be broadcast and the seed hand-raked into the soil. When broadcasting the seed the rate per acre should be doubled.

2. To maintain esthetic values, all semi-permanent and permanent facilities will require painting or camouflage to blend with the natural surroundings.

Unless a change is mutually agreed upon, the following permanent facilities will be painted _____ which is a standard color reference number from the Munsell Soil Color Charts. Typical facilities that would require painting might include all high level equipment such as tanks, separators, heater treaters (except fire box and stack), large flow lines (above 4 inches), and equipment buildings. Small size flow lines, low level equipment, and small or galvanized wire and pipe not normally painted may not require painting. If this type of equipment is normally painted or was painted during previous use, color contrast will be evaluated using the current painting requirements. It is desirable that as much equipment as possible be painted a uniform noncontrasting color.

Permanent structures are considered to be those facilities which are on site more than ninety (90) days after completion of the well.

The surface management agency will select appropriate colors from the following list of standard colors. The Munsell Color reference number is listed:

Shale Green (5Y 4/2)	Sudan Brown (2.5Y 4/2)
-------------------------	---------------------------

Brush Brown (10YR 5/3)	Desert Brown (10YR 6/3)
---------------------------	----------------------------

Brick Red (10R 4/4)	Yuma Green (5Y 3/1)
------------------------	------------------------

Dusty Brown (10YR 4/2)	Sand Beige (5Y 6/3)
---------------------------	------------------------

Slate Gray (5Y 6/1)	Carlsbad Canyon (2.5Y 6/2)
------------------------	-------------------------------

3. Standard Paleontological Stipulation - refer to "Fossils" section under Management Common to All Alternatives.
4. Any cultural resource (historic or prehistoric site or object) discovered by the operator, or any person working on his behalf, shall be immediately reported to the BLM Authorized Officer. The operator shall suspend all operations in the area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the BLM to determine appropriate actions to prevent the loss of significant cultural values. The operator will be responsible for the cost of evaluations and for mitigation. Mitigation may include relocation or excavation, and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the operator.
5. Construction of roads or drill pads with frozen earth material mixed with snow and ice, or muddy earth material will not be allowed.

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SUMMARY OF COAL PLANNING IN THE KEMMERER RESOURCE AREA

INTRODUCTION

This summary documents the Pioneer Trails Coal Planning Amendment (March 1982) to the 1977 Pioneer Trails MFP and the updated coal planning review conducted for the purposes of the Kemmerer Resource Area (KRA) resource management plan (RMP). The general location of the area is found on Map 13.

All figures for coal tonnages are approximate and based upon data (average tons per acre) obtained from Geological Survey Coal Resource Occurrence - Coal Development Potential (CRO/CDP) maps. The figures apply to the Federal coal lands with development potential and high interest for development (Maps 14 and 15). Tonnage projections are for Federal planning purposes only, since CRO/CDP maps do not identify coal tonnages for non-Federal coal.

The term "high and moderate coal" in the 1982 amendment refers only to Federal coal with high and moderate development potential by both surface and subsurface mining methods. High development potential coal for surface mining has a stripping ratio of 0 to 10 cubic yards of overburden per ton of coal. Moderate development potential coal for surface mining has a stripping ratio of 10 to 15 cubic yards of overburden per ton of coal. Areas of high and moderate coal development potential for subsurface mining methods are defined as areas underlain by coal beds at depths ranging from 200 to 1,000 feet and 1,000 to 2,000 feet, respectively, and having dips of less than 15 degrees.

Because of recent changes in the Federal coal regulations, new BLM planning efforts no longer address coal lands in terms of high or moderate development potential. Rather, they are addressed in terms of any degree of development potential and/or public interest in coal development. A formal call for coal resource information and identification of interest in developing Federal coal in the KRA was published in the Federal Register. There were no responses to the call. Since BLM has no additional coal resource data of significance than was available for the 1982 amendment, and since the amendment did address coal lands in addition to those with high and moderate development potential, the Federal

coal areas considered in this RMP were not expanded beyond those considered in the 1982 amendment.

The regulation changes also affected some of the coal unsuitability criteria. Only the change in criterion No. 7 had any affect on the coal planning in the KRA. The change in this criterion removed from unsuitability consideration those values of historic, architectural, archeological, or cultural significance on Federal lands which are "eligible for inclusion" in the National Register of Historic Places. Only such values on areas which are included in the National Register are now applicable under this criterion.

In accordance with the four-step coal screening process (described below) the updated coal planning review for the RMP addressed the sites that are "eligible" for National Register listing in the evaluation of other multiple-use conflicts, rather than in the application of the coal unsuitability criteria.

Prior to preparing the 1982 amendment, a civil suit (concerning the adequacy of the coal unsuitability criteria and their applicability to existing Federal coal leases) was filed by Texaco Incorporated and the National Coal Association, et al. vs. Cecil D. Andrus, Secretary, Department of the Interior, et. al. "Existing Federal coal leases" are generally defined as those that were issued prior to the effective date of the Surface Mining Control & Reclamation Act (SMCRA) of 1977. A United States District Court decision on this suit (August 15, 1980) remanded several parts of the coal regulations to the Secretary concerning his authority to apply some of the unsuitability criteria to existing leases. The decision was appealed by BLM and, at the time of the 1982 amendment, had not been fully resolved. However, BLM conceded that existing, "producing" leases were exempt from application of all the unsuitability criteria (and other coal screening procedures) and that existing "non-producing" leases were exempt from only the application of unsuitability criteria 9 through 15. Accordingly, the 1982 Amendment addressed non-producing Federal coal leases through application of unsuitability criteria 1-8 and 16-20 and a multiple-use conflict evaluation.

The 1982 amendment clearly pointed out that the findings of these coal screening steps conducted on the nonproducing leases did not

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constitute actual land use planning decisions. As a matter of efficiency and timing, BLM elected to conduct this screening during land use planning and to identify the results in the amendment to serve as a basic resource analysis for later use in developing necessary stipulations and mitigation requirements for future mining and reclamation plans and for lease readjustments. This was further projected in Decision No. 4 of the amendment which deferred any BLM actions on non-producing leases until mining and reclamation plans are submitted or until lease readjustments occur.

Since completion of the amendment in 1982, the civil suit and BLM's appeal have been resolved. The result was the determination that all existing Federal coal leases (producing and non-producing) are exempt from application of all the coal unsuitability criteria (and, thus, from the other coal screening procedures) that are within BLM's responsibilities and authority. The basic premise for this determination is that; any parts of Section 522 of SMCRA, concerning areas unsuitable for surface coal mining operations on existing Federal coal leases, are under the authority and responsibilities of the Office of Surface Mining (OSM) and State government and will be addressed by those entities in the course of mine plan approval and permitting. Thus, the documented results of coal screening on non-producing leases in the amendment is no longer appropriate and decision No. 4 in the amendment is no longer valid.

In comparing the following summary with that of the 1982 amendment document, the net effect of the current coal regulations and the updated coal planning review is "no change" from the 1982 coal planning decisions. The competitive Federal coal areas reviewed and the end results of the coal planning are similar. The only evident differences are the separated documentation of National Historic Register sites and those "eligible" for Register listing, correction of minor errors on the maps in the 1982 amendment and omission of documentation and decisions pertaining to non-producing leases. Also, decisions 4, 5, and 6 in this summary are the same as decisions 5, 6, and 7, respectively, in the amendment.

PURPOSE, NEED, CONFORMANCE

The 1982 amendment was conducted to assure that the Pioneer Trails MFP would reflect and be

in conformance with current statutory requirements and policies relating to potential Federal coal development. The 1977 MFP covering the review area was prepared prior to passage of the Surface Mining Control & Reclamation Act of 1977 and the subsequent adoption of the BLM planning regulations and the Federal Coal Management Program and regulations by the Secretary of the Interior in 1979. The purpose of the amendment was to arrive at coal management decisions for the KRA that would guide the allocation of the Federal coal resource development by both surface and subsurface mining methods; and provide an analysis which can be used in considering areas for new competitive Federal coal leasing and proposals for lease modifications, emergency leases, and exchanges.

In addition, the purpose of the updated coal planning review for this RMP was to determine if the 1982 coal planning decisions were still valid and if additional coal development interests or resource data involved any previously unplanned coal areas that should be addressed in the RMP.

OBJECTIVES

The objectives for both the 1982 amendment and the updated coal planning review were to develop management direction for the Federal coal resource in the KRA that would (1) provide for both short and long range opportunity for developing Federal coal in an orderly and timely manner, consistent with the Federal Coal Management Program, current regulations and policy, environmental integrity, national energy needs, and related demands; and (2) identify as much Federal coal as possible as acceptable for development and for further leasing consideration to help meet coal production goals and development interests for 5 to 15 years.

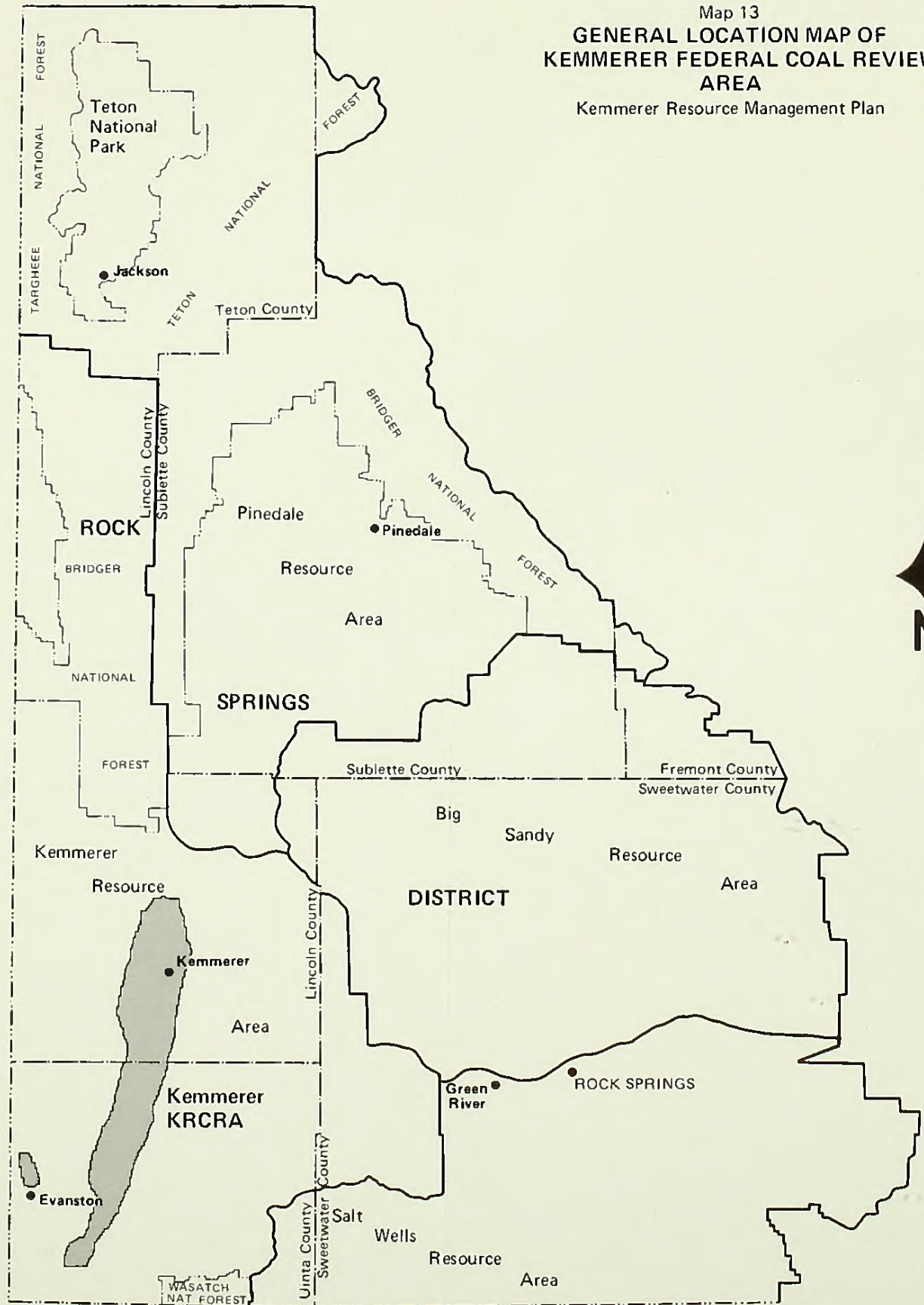
AREA DESCRIPTION

The area reviewed for Federal coal development in the KRA is shown on the General Location Map (Map 13).

The review area contains an estimated 71.5 million tons of unleased Federal coal reserves with development potential or interest in development. This coal contains an average 11,999 British Thermal Units (BTUs) of energy per pound and

Map 13
**GENERAL LOCATION MAP OF
KEMMERER FEDERAL COAL REVIEW
AREA**

Kemmerer Resource Management Plan



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an average sulfur content of 0.9 percent (based on estimates in Geological Survey CRO/CDP mapping data).

Some of this area has a checkerboard pattern with alternating sections of Federal and non-Federal land and coal ownership. There are also areas of Federal surface ownership over State and privately owned coal, and private surface ownership over Federally owned coal, or so-called "split estate" lands.

ALTERNATIVES CONSIDERED FOR THE 1982 COAL MFP AMENDMENT

No Action Alternative

The no action alternative was a continuation of existing management. Since the 1977 MFP coal management decisions were not in conformance with new legislation and new Federal coal program and regulation requirements, they were invalid. A reassessment and any necessary modification of those decisions was required before Federal coal leasing could be considered in the KRA.

The environment would not be affected beyond current impacts by this alternative. Since no new Federal coal areas would be leased or developed, opportunities for development would be foregone and the lands would remain closed to further consideration for leasing.

Proposed Action Alternative

Under the proposed action alternative, the 1977 MFP was amended and brought into conformance with current laws, regulations, and policies. The land use planning decisions in the amendment identified the Federal coal lands that were acceptable, acceptable with certain stipulations and mitigation requirements, acceptable and deferred pending studies, acceptable for very limited surface operations and impacts, and unavailable for coal development.

The decisions also identified the coal lands that would be given further consideration for new competitive coal leasing, emergency leasing, lease modifications, and exchange proposals under the Federal Coal Management Program.

Approximately 25 million tons of Federal coal were determined to be acceptable for

development by surface mining methods and for further leasing consideration; approximately 33 million tons of Federal coal was determined to be acceptable for development by subsurface mining methods and for further leasing consideration. Should proposed coal lease tracts be delineated in the KRA, the environmental impacts of developing the coal would be addressed in site-specific tract analyses and in a regional coal EIS before they could be offered for sale. Surface and environmental disturbances either would not be allowed or would be mitigated through compliance with lease stipulations, mine permitting stipulations, and existing laws governing protection and reclamation. There is no commitment that proposed lease tracts would either be leased or developed.

ALTERNATIVES CONSIDERED IN THE UPDATED COAL PLANNING REVIEW

To help the reader better understand the results of considering the alternatives, as summarized below, it is important to be aware of the Federal Coal Management Program events and actions that have occurred to date in the KRA, since the MFP coal amendment was completed in 1982. Coal activity planning for the second round of Federal coal leasing in the Green River-Hams Fork Coal Production Region was in progress when the 1982 amendment was completed. As a result of the call for expressions of leasing interest, two proposed coal lease tracts were delineated in the KRA: Tract 98 and Byrne Creek Tracts (Map 13).

Tract 98 involves approximately 165 acres of Federal land of which about 45 acres contains mineable Federal coal. It is identified as a maintenance tract and the coal involved is in jeopardy of being bypassed by active operations of the adjacent South Block Mine. The Pittsburgh & Midway Coal Mining Co. (South Block Mine) has recently filed an emergency lease application. The application is currently being considered by BLM.

The Byrne Creek Tract involves about 2,230 acres of Federal, State, and private lands and coal. It has potential for development as either a new mining operation or an extension of the adjacent, non-producing South Haystack Mine proposal (Cumberland Coal Co.).

Site-specific analyses and summary profiles have been prepared for both of these tracts (USDI,

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1983). Site-specific mitigation requirements were incorporated in the leasing and development proposals addressed in these analyses. These requirements were developed from the findings of the coal screening process and the MFP amendment decisions. Further, these mitigation requirements were incorporated in the appropriate coal development alternatives analyzed in the Draft Round II Green River-Hams Fork Regional Coal EIS (USDI, 1983). Final development and determination of mitigation requirements for these tracts are pending the completion of the Regional Coal EIS. The final determination of mitigation requirements for Tract 98 may occur through processing the emergency lease application.

In conducting the updated coal planning, the proposed Byrne Creek tract and Tract 98 were found to be in conformance with this RMP. The Federal coal lands within these tracts are acceptable for further consideration for leasing and development.

Due to changes in policies, regulations, and Congressional Committee investigations concerning the Federal Coal Management Program that have occurred since 1982, preparation of a supplement to the Federal Coal Management Program EIS is being initiated. Tentative dates for completing the regional coal EIS or for holding a round II regional coal lease sale are unknown. The effects the supplement may have on these actions or on coal leasing and development in the KRA cannot be anticipated. A pertinent factor related to these situations is the significant drop in the market and demand for coal that has occurred since 1982.

As depicted on Maps 14 and 15, the remaining Federal coal areas in the KRA that can be given future leasing consideration are very small, few and geographically scattered. While these areas may appear to have little likelihood or value for development, they may become important to future development as a result of revived market conditions, new coal resource data, or coal development on surrounding private and State lands.

The 1982 coal planning was updated to be in conformance with current regulations and the Flannery Decision. The result was no change in the 1982 coal decisions concerning "unleased" (competitive) Federal coal areas. Only the invalid decision concerning future BLM actions on existing non-producing coal leases was affected. This decision had no bearing on the identification or availability of Federal coal areas for future leasing consideration. Thus, for the purposes of this RMP, the consideration of alternatives for

Federal coal management in the KRA was in the context of alternatives to the 1982 coal decisions and to the update of those decisions.

The alternatives considered were:

No Action

Under this alternative, the coal planning and decisions of the 1982 amendment would remain as is. The updated planning review would not be conducted.

Analysis: At the minimum, it is required to review existing planning decisions for current adequacy and to update or change them accordingly.

Determination: This alternative is invalid and will not be further addressed.

Identify Additional Federal Coal Areas for Future Leasing Consideration

Under this alternative, the RMP would include additional coal planning on Federal coal lands in the KRA that were not considered in the 1982 amendment. The possible outcome of the planning would be identifying more Federal coal areas as acceptable for development and for future leasing consideration.

Analysis: While other coal deposits exist in areas outside of those studied in 1982, evaluation of available data shows that the coal quantity and quality are so low that the potential for either leasing interest or development cannot be expected within the 5- to 15-year outlook and scope of the RMP. The total lack of response to the request for development interests and additional resource data and the coal market outlook were also supporting factors to this conclusion.

Determination: This alternative would be unrealistic for the scope and purpose of the RMP and will not be further addressed.

Remove Certain Federal Coal Lands From Leasing Consideration and Impose a No Surface Occupancy Stipulation on Others

In reference to the coal planning decisions summarized in this appendix, this alternative involves the lands covered by Decisions 1c, 2b,

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and 2c. It would result in either determining the lands covered by Decisions 1c and 2c to be unsuitable for coal development and leasing consideration or to defer them from leasing consideration until the needed studies are completed. It would also result in placing a blanket no surface occupancy constraint on the lands covered by Decision 2b.

Analysis: Decision 2b, as stated, is sufficiently clear in representing a basic no surface occupancy requirement that may be excepted on only a case-by-case and very stringent basis. It is appropriate to make these determinations in relation to a detailed mine plan proposal, which is a post lease activity.

Decisions 1c and 2c involve lands that require additional study to determine specific mitigation requirements that may (or may not) be needed, if they were to be mined, or to make a firm determination of whether or not they are unsuitable (partially or wholly) for mining. Of particular concern are those areas BLM has identified as “possible” alluvial valley floors (AVFs), that are acceptable for coal development and leasing consideration pending final AVF determinations. Such determinations (or designations) are under the authority of the Office of Surface Mining and State government and are usually made in relation to a detailed mine plan proposal.

Consideration of this situation is threefold. First, BLM’s use of the term “possible AVF” is strictly in the literal context of the physical (AVF) feature. Second, the actual designation of an AVF does not, in itself, mean that it is unsuitable for mining. Rather, a determination that “mining (of an AVF) would interrupt, discontinue, or preclude farming” would make it unsuitable (43 CFR 3461.1(5)1). Third, if mining of Federal lands “outside an alluvial valley floor (i.e., the physical feature) would materially damage the quantity or quality of water in surface or underground water systems that would supply alluvial valley floors”, the lands would be unsuitable for mining (43 CFR 3461.1(5)1). The possible AVFs identified do not include either (1) farming areas that would be directly or indirectly impacted; or (2) the knowledge that possible direct or indirect impacts to either farming areas or AVF water systems cannot be mitigated. It is not possible to make sound determinations on these factors without a detailed mine plan, which, again, is a post lease activity.

In both of the above cases, unless and until specific mining-related surface disturbance or uses are proposed (i.e., in a mine plan), it is not possible to determine whether or not they can

be allowed or under what specific conditions they may be allowed. Further, the pending studies are both basic support to making these site specific determinations and integral requirements to developing a mine plan in order to obtain its approval and a mining permit. In the interim, the three decisions, as stated in this summary, mean that activities that would cause significant and unnecessary adverse impacts to the surface resources and environmental concerns involved would not be allowed. Thus, if there will be serious interest in developing the Federal coal in these areas of real or potential sensitivity, it is incumbent upon the party(ies) of interest to bear the burden of proof that it can be done in an environmentally sound and legal manner, or the areas will not be approved or permitted for mining or related disturbances.

Determination: Consideration of the kinds of options represented by this alternative is an integral part of the coal screening/land use planning procedures. They were considered in both the 1982 amendment and the updated planning review for this RMP. In neither instance did BLM find sound bases or logic to support this alternative. In view of the stringent pre-lease requirements, including site-specific and cumulative environmental impact analyses and post lease requirements to obtain an approved mine plan and mining permit, the sensitive areas of concern are in no jeopardy of significant or unnecessary adverse affects. Therefore, this alternative will not be addressed further.

Review of 1982 Amendment Coal Decisions for Current Adequacy and Update if Necessary

This is the preferred alternative.

Analysis: Given that the lands that were included in the 1982 amendment are considered adequate for leasing during the RMP’s timeframe (see discussion in the second alternative considered above), it is reasonable for the purpose of the RMP to analyze them for adequacy in light of current regulations and policies.

Determination: This alternative would provide the updating needed to comply with changes in regulations and policy since 1982, without imposing unreasonable restrictions on new leasing.

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PROCEDURES

The Federal Coal Management Program established four major steps to be used in the identification of Federal coal areas that are acceptable for coal development. The four steps are (1) identification of coal areas with development potential and/or interest in development; (2) application of the coal unsuitability criteria; (3) multiple-use conflict evaluation; and (4) surface owner consultation. Collectively, these steps are called the "Coal Screening Process" (43 CFR 3420.1-4) and are applied in sequence to the review area.

STEP 1 — Identification of Coal Areas

Areas of coal development potential for both surface and subsurface mining were identified using Geological Survey CRO/CDP maps and using geological and economic data submitted by coal companies and interpretations of available geological data from various other sources. In applying this screening step, some areas of low and unknown coal development potential and with no known interest in development were excluded from further consideration.

The remaining three screening steps were applied to the coal areas identified in Step 1. These latter steps are applied in sequence and only to the lands identified as acceptable for coal development in each preceding step.

STEP 2 — Application of Coal Unsuitability Criteria

As required by 43 CFR 3461, the 20 coal unsuitability criteria were applied to the coal areas identified in Step 1.

The purpose of this step is to identify areas with key features or environmental sensitivity that would make them unsuitable for surface coal mining, subsurface coal mining, or for surface operations and impacts associated with subsurface coal mining.

STEP 3 — Multiple-Use Conflict Evaluation

This step involves consideration of other multiple-use values (i.e., not concerned with the unsuitability criteria) and identifying any additional areas that would be unacceptable for surface coal mining, subsurface coal mining, or for surface operations and impacts associated with subsurface coal mining.

STEP 4 — Surface Owner Consultation

Section 714 of the Surface Mining Control and Reclamation Act requires BLM to consult with certain "qualified" owners of split estate lands (i.e.,

private surface ownership over Federally owned coal) when surface mining of the Federal coal is being considered. This step does not apply to areas where only subsurface mining methods are concerned. It involves only those split estate lands within competitive Federal coal areas that remain acceptable for development by surface mining methods after conducting the multiple-use conflict evaluation.

In this consultation process, qualified surface owners are asked to express their preference for or against surface mining of the Federal coal under their private lands. Either an individual or significant numbers of these surface owners expressing a preference against surface mining, can result in identifying split estate lands as unavailable for coal development. Such areas can still be considered for possible leasing beyond this land use planning stage. This is possible because the commitment of surface owner consent or refusal to consent does not occur until later in the coal activity planning process, prior to offering a lease for the Federal coal involved.

HOW THE PROCEDURES ARE APPLIED

The coal screening steps were applied to competitive Federal coal areas. Competitive coal areas are those with the potential to be considered for new competitive Federal coal leasing, modifications to existing leases, emergency leasing, and exchanges.

Competitive Federal Coal Areas (Surface Mining)

All four steps of the screening process are applicable to these areas.

Competitive Federal Coal Areas (Subsurface Mining)

Only steps 1 through 3 of the screening process are applicable to these areas.

FINDINGS

The following is a summary of the findings and

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related recommendations resulting from conducting the coal screening process. All acreage and coal tonnage figures are approximate. Additional documentation and background information, explaining in detail how the procedures were used and the findings made, are available for public review at BLM's Rock Springs District and Kemmerer Resource Area Offices. The coal screening results summarized below reflect the outcome of the updated coal planning review of the 1982 MFP amendment, in conformance with the recent regulation changes.

COAL AREAS WITH DEVELOPMENT POTENTIAL AND/OR INTEREST IN DEVELOPMENT

Table B-2-1 summarizes the findings of Step 1 - Federal Coal Areas with Development Potential and/or Interest in Development.

UNSUITABILITY CRITERIA

The following discussion briefly explains the findings resulting from application of each unsuitability criterion. Table B-2-2 lists the findings by criterion, and Tables B-2-3 and B-2-4 summarize the overall results of the application of the unsuitability criteria. Maps 13 and 14 also show the overall summary results of applying the criteria.

Criterion No. 1 — Federal Land Systems

No areas were determined to be unsuitable under this criterion.

Criterion No. 2 — Rights-of-Way and Easements

Most of the rights-of-way crossing the coal areas can be relocated to accommodate coal mining and related activities. Thus, BLM made a "general" determination that most right-of-way areas are acceptable for coal development, subject to, valid existing rights and negotiations for relocating if necessary, appropriate stipulations, and consistency with current planning and management decisions. Any conflicts in these areas should be identified and resolved during the coal activity planning process or in mining and reclamation plan development. Only those areas where coal development would create significant conflicts with rights-of-way are identified below.

Surface Mining Areas: About 18 acres containing approximately 0.08 million tons of coal were determined to be unsuitable for surface mining methods. The right-of-way involved is Interstate 80 (400-foot right-of-way on highway, 800-foot at interchanges).

Subsurface Mining Areas: No areas were determined to be unsuitable in these areas.

Criterion No. 3 — Buffer Zones for Rights-of-Way, Communities, and Buildings

Surface Mining Areas: About 5 acres containing approximately 0.2 million tons of coal were determined to be unsuitable for surface mining methods. The right-of-way involved is Interstate 80.

Subsurface Mining Areas: No areas were determined to be unsuitable.

Criterion No. 4 — Wilderness Study Areas

No areas were determined to be unsuitable under this criterion.

Criterion No. 5 — Scenic Areas

No areas were determined to be unsuitable under this criterion.

Criterion No. 6 — Lands Used for Scientific Study

No areas were determined to be unsuitable under this criterion.

Criterion No. 7 — Historic Lands and Sites

No areas were determined to be unsuitable under this criterion.

Criterion No. 8 — Natural Areas

No areas were determined to be unsuitable under this criterion.

Criterion No. 9 — Federally Listed Endangered Species Habitat

No areas were determined to be unsuitable under this criterion. Due to potential habitat for black-footed ferrets, about 930 acres will carry a stipulation requiring ferret searches and resulting habitat protection requirements, in accordance with Fish and Wildlife Service guidelines; searches to be made within no more than one year prior to any surface disturbance in the potential habitat areas.

Criterion No. 10 — State Listed Endangered Species Habitat

No areas were determined to be unsuitable under this criterion.

Criterion No. 11 — Bald and Golden Eagle Nests

TABLE B-2-1
FEDERAL COAL DEVELOPMENT POTENTIAL
(Competitive Coal Areas)

	Acres		Tons <u>1/</u> (Millions)
High and Moderate Potential for <u>2/</u>			
Surface Mining Methods	4,885		20.8
Subsurface Mining Methods	550		3.8
Surface and Subsurface Mining Methods (Overlap)	200	(Surface)	0.8
		(Subsurface)	1.4
Other areas assumed to have Moderate Potential for Surface and Subsurface Mining Methods <u>3/</u>			
	4,235	(Surface)	14.1
		(Subsurface)	29.0

1/ Tonnage computation for this and all other tables was based upon an average of 4,248 tons per acre for surface mining methods (100% recovery) and 6,846 tons per acre for subsurface mining methods (50% recovery). These averages were derived from high and moderate coal development potential areas as identified by Geological Survey CRO/CDP Maps and open file reports.

2/ Derived from Geological Survey CRO/CDP Maps.

3/ Derived from indications of industry interest and other available resource data.

TABLE B-2-2

APPLICATION OF UNSUITABILITY CRITERIA
COMPETITIVE FEDERAL COAL AREAS

Criterion	Surface Mining Methods ^{1/}				Subsurface Mining Methods ^{1/}			
	Unsuitable ^{1/}		Acceptable ^{2/}		Unsuitable ^{1/}		Acceptable ^{2/}	
	Acres	Tons*	Acres	Tons*	Acres	Tons*	Acres	Tons*
Federal Land Systems	0	0	9,120	38.7	0	0	4,785	32.8
Rights-of-Way and Easements	18	0.08	9,102	38.7	0	0	4,785	32.8
Buffer Zones for Rights-of-Way, Communities and Buildings	5	0.02	9,115	38.7	0	0	4,785	32.8
Wilderness Study Areas	0	0	9,120	38.7	0	0	4,785	32.8
Scenic Areas	0	0	9,120	38.7	0	0	4,785	32.8
Land Used for Scientific Study	0	0	9,120	38.7	0	0	4,785	32.8
Historic Lands and Sites	0	0	9,120	38.7	0	0	4,785	32.8
Natural Areas	0	0	9,120	38.7	0	0	4,785	32.8
Federally Listed Endangered Species Habitat	0	0	9,120	38.7	0	0	4,785	32.8
State Listed Endangered Species Habitat	0	0	9,120	38.7	0	0	4,785	32.8
Bald and Golden Eagle Nests	479	2.0	8,641	36.7	0	0	4,785 13 ^{4/}	32.8
Bald and Golden Eagle Roost and Concentration Areas	0	0	9,120	38.7	0	0	4,785	32.8
Falcon Cliff Nesting Sites	639	2.7	8,481	36.0	0	0	4,785 188 ^{4/}	32.8
Migratory Bird Habitat	905	3.8	8,215	34.9	0	0	4,785 201 ^{4/}	32.8
Habitat for State High-Interest Wildlife	1,499	6.4	7,621	32.4	0	0	4,785 1,712 ^{4/}	32.8
Floodplains	0 ^{3/}	0	9,120	38.7	0	0	4,785	32.8
Municipal Watersheds	0	0	9,120	38.7	0	0	4,785	32.8
National Resource Waters	0	0	9,120	38.7	0	0	4,785	32.8
Alluvial Valley Floors	0 ^{3/}	0	9,120	38.7	0	0	4,785 53 ^{4/}	32.8
State-Proposed Criteria	0	0	9,120	38.7	0	0	4,785	32.8

* Millions

^{1/} The acres and Federal coal tonnages listed under each criterion occasionally overlap areas and tonnages found unsuitable under other criteria. Thus, the total acres excluded from development by all the unsuitability criteria will be less than the sum of the individual listings under each criterion.

^{2/} Acceptable area may include areas acceptable with stipulations and acceptable pending study.

^{3/} After application of exceptions.

^{4/} This portion of the total acreage assessed for subsurface mining is acceptable for only limited surface operations and impacts associated with subsurface mining (e.g., subject to restrictive placement and types of facilities, seasonal occupancy, etc.). Tonnages are not affected, since subsurface mining "itself" is still acceptable under these areas.

TABLE B-2-3

SUMMARY-APPLICATION OF UNSUITABILITY CRITERIA
COMPETITIVE FEDERAL COAL AREAS

Determination	Federal Surface Federal Coal		Private Surface Federal Coal		Total Federal Coal	
	Acres	Tons ^{1/} (Millions)	Acres	Tons ^{1/} (Millions)	Acres	Tons ^{1/} (Millions)
Areas with Surface Mining Potential						
Unsuitable	3,034	12.9	247	1.0	3,281	13.9
Acceptable ^{2/}	4,778	20.3	1,061	4.5	5,839	24.8
Areas With Subsurface Mining Potential						
Unsuitable	0	0	0	0	0	0
Acceptable ^{2/}	4,425	30.3	360	2.5	4,785	32.8
Surface Operations And Impacts Associated With Subsurface Mining						
Unsuitable	0	N/A	0	N/A	0	N/A
Acceptable with limitations	2,547	N/A	347	N/A	2,894	N/A
Acceptable ^{3/}	1,878	N/A	13	N/A	1,891	N/A

^{1/} See footnote ^{1/} on Table B-2-1.

^{2/} Acceptable area includes areas acceptable with stipulations and acceptable pending study.

^{3/} This portion of the total acreage assessed for subsurface mining is acceptable for only limited surface operations and impacts associated with subsurface mining (e.g., subject to restrictive placement and types of facilities, seasonal restrictions, etc.). Tonnages are not affected, since subsurface mining "itself" is still acceptable under these areas.

TABLE B-2-4

SUMMARY OF RESULTS - COAL SCREENING PROCESS

Determination	Competitive Federal Coal			
	Surface		Subsurface	
	Acres	Tons ^{1/} (Millions)	Acres	Tons ^{1/} (Millions)
Known & Assumed High High & Moderate Coal Development Potential	9,120	38.7	4,785	32.8
Unsuitable Area	3,281	13.9	0	0
Unacceptable Area	0	0	0	0
Unavailable Area	40	0.2	N/A	N/A
Total Area & Federal Coal Eliminated	3,321	14.1	0	0
Remaining Area & Federal Coal Acceptable for Coal Development ^{2/}	5,799	24.6	4,785 ^{3/}	32.8

^{1/} See footnote ^{1/} on Table B-2-1.

^{2/} Acceptable area also includes areas acceptable with stipulations and acceptable pending study.

^{3/} Of these acres, 1,891 are acceptable for only limited surface operations and impacts associated with subsurface mining (e.g., subject to restrictive placement and types of facilities, seasonal restrictions, etc.). Tonnages are not affected.

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Eagle nests and appropriate buffers were identified by the Fish and Wildlife Service, BLM, and the Wyoming Game and Fish Department.

Surface Mining Areas: About 479 acres containing approximately 2.0 million tons of coal were determined to be unsuitable for surface mining methods.

Note - 213 of these acres overlap with unsuitable areas under Criterion No. 13.

Subsurface Mining Areas: About 13 acres are acceptable for only limited surface operations and impacts associated with subsurface mining (e.g., subject to restrictive placement and types of facilities, seasonal restrictions, etc.).

Criterion No. 12 — 1Bald and Golden Eagle Roost and Concentration Areas

No areas were determined to be unsuitable under this criterion.

Criterion No. 13 — Falcon Cliff Nesting Sites

Surface Mining Areas: About 639 acres containing approximately 2.7 million tons of coal were determined to be unsuitable for surface mining methods.

Subsurface Mining Areas: About 188 acres are acceptable for only limited surface operations and impacts associated with subsurface mining (e.g., subject to restrictive placement and types of facilities, seasonal restrictions, etc.).

Note - These 188 acres overlap with portions of the 639 acres mentioned above.

Criterion No. 14 — Migratory Bird Habitat

Surface Mining Areas: About 905 acres containing approximately 3.8 million tons of coal were determined to be unsuitable for surface mining methods.

Note - These 905 acres overlap with unsuitable areas under Criteria No. 11 and No. 13.

Subsurface Mining Areas: About 201 acres are acceptable for only limited surface operations and impacts associated with subsurface mining (e.g., subject to restrictive placement and types of facilities, seasonal restrictions, etc.).

Note - These 201 acres coincide with the 13 acres under Criterion No. 11 and the 188 acres under Criterion No. 13 with the same limitations.

Criterion No. 15 — Habitat for State High-Interest Wildlife

The primary habitat considerations involved with the coal areas are sage grouse breeding and nesting grounds and critical big game winter ranges. Through consultation with the Wyoming Game and Fish Department and the Governor's

Office, it was determined that the sage grouse habitat areas are acceptable for coal development (surface or subsurface) with stipulations and mitigation requirements for habitat improvement, development, and reclamation. The areas involved are identified on Maps 14 and 15 as "Exception Areas" under this criterion. The following pertains only to critical deer and antelope winter range areas.

Surface Mining Areas: About 1,499 acres containing 6.4 million tons of coal were determined to be unsuitable for surface mining methods.

Subsurface Mining Areas: About 1,712 acres are acceptable for only limited surface operations and impacts associated with subsurface mining (e.g., subject to restrictive placement and types of facilities, seasonal restrictions, etc.).

Note - These 1,712 acres overlap with portions of the 1,499 acres mentioned above.

Criterion No. 16 — Floodplains

No areas were determined to be unsuitable under this criterion.

Through consultation with the Geological Survey, it was determined that all identified floodplain areas can be mined in such a manner that all or certain stipulated methods of coal mining can be undertaken without substantial threat of loss to people or property and to the natural and beneficial values of the floodplain, either on a coal lease tract or downstream. Examples of lease stipulations may include but are not limited to relocation of channels during mining and restoration of channel locations after mining, controlling sediment yields and prohibiting spoil dumping in channels, lining channel bottoms, revegetation and general mined land reclamation, etc. The areas involved are identified on Maps 13 and 14 as "Exception Areas" under this criterion.

Criterion No. 17 — Municipal Watersheds

No areas were determined to be unsuitable under this criterion.

Criterion No. 18 — National Resource Waters

No areas were determined to be unsuitable under this criterion.

Criterion No. 19 — Alluvial Valley Floors

No areas were determined to be unsuitable under this criterion.

In consulting with the Office of Surface Mining (OSM) and State government, it was concluded that final determination of alluvial valley floors is the responsibility of OSM and the State at the

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time of mine plan approval and mine permitting. The following pertains only to “possible” alluvial valley floors identified by BLM.

Surface Mining Areas: About 78 acres containing approximately 0.3 million tons of coal were determined to be acceptable for further consideration for coal development by surface mining methods, pending final determination of alluvial valley floors by OSM and the State of Wyoming.

Subsurface Mining Areas: About 53 acres containing approximately 0.2 million tons of coal were determined to be acceptable for further consideration for coal development by subsurface mining methods, pending final determination of alluvial valley floors by OSM and the State of Wyoming.

Note - These 53 acres overlap with portions of the 78 acres mentioned above.

Criterion No. 20 — State Proposed Criterion

No areas were determined to be unsuitable under this criterion.

EVALUATION OF OTHER MULTIPLE-USE CONFLICTS

Conflict 1

Surface coal mining would conflict with the historic site of Bear River City along the Mormon Pioneer-California Trail segment. While not yet determined, this site is potentially eligible for listing in the National Register of Historic Places.

Analysis: This conflict potentially affects about 40 acres in the immediate vicinity of the site now known as Beartown. Before surface mining or disturbance is allowed on this site, it should be studied to determine its eligibility for the National Register of Historic Places. This area is covered by an unsuitable area under Criterion No. 15.

Determination: Since this historic site is already covered by an unsuitable area, no net effect to acres and coal tonnages would result and further protection of the site, for the purposes of coal planning requirements, is unnecessary. However, the need to determine eligibility of the site for listing in the National Register of Historic Places should be pursued.

Conflict 2

Surface coal mining would conflict with several historic trail segments and a few prehistoric and archaeological sites within the review area. These trail segments and sites are “eligible” for listing on the National Register of Historic Places.

Analysis: Segments of the Oregon National Historic Trail, Mormon Pioneer National Historic Trail, California Trail, and Sublette Cutoff are located in the KRA and cross some of the coal areas reviewed. Another trail segment (Mormon Pioneer - California Trail) has already been affected by visual intrusion, via the Union Pacific Railroad and an improved road over portions of the trail. In addition to these trail segments, two prehistoric sites and one archeological site could be impacted by surface coal mining. In researching National Park Service reports on the National System of Historic Trails, and in consulting with the Wyoming State Historic Preservation Officer, it was found that these trail segments and sites are eligible for National Register listing.

Determination: The Mormon Pioneer - California Trail segment and a one-quarter-mile wide area along either side of it are acceptable for further consideration for surface mining, pending studies to determine the integrity of the site and any buffer zone needs. The two prehistoric and one archaeological sites are acceptable for surface mining with the stipulation that a mitigation plan must be prepared, to include provisions for recovery of scientific data by partial or complete excavation of the sites prior to any surface disturbance. The mitigation plan would be prepared, relative to a mine and reclamation plan, in consultation with and subject to approval by BLM, the Wyoming SHPO, and the Advisory Council on Historic Preservation. The effect of these trail segments and sites upon the coal areas are as follows:

Surface Mining Areas: About 150 acres containing approximately 0.6 million tons of coal were determined to be acceptable for surface mining methods, pending studies to determine historic site integrity and buffer zone needs.

About 20 acres containing approximately 0.08 million tons of coal were determined to be acceptable for surface mining methods with certain stipulations and mitigation requirements.

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Subsurface Mining Areas: None of the subsurface coal mining areas are affected.

Potential Conflict 3

Either surface or subsurface coal mining would conflict with producing oil and gas areas. This potential conflict was surfaced during the public review period for the proposed Pioneer Trails MFP coal decisions issued in November 1981.

Analysis: Currently there are no producing oil and gas fields in any of the competitive Federal coal areas under review. However, the coal areas are essentially blanketed with existing oil and gas leases. With drilling activities continuing, producing oil and gas fields could be established on the coal areas before coal leases are issued.

It is generally acceptable to issue Federal leases for more than one mineral resource on the same land area. However, it is the intent of BLM to maximize production of energy resources and avoid situations where development of one energy resource would be to the detriment of another. If such a conflict develops, it could result in affected competitive coal areas being deferred from leasing, until it is determined that surface or subsurface mining methods will not interfere with oil and gas operations and economic recovery of the oil and gas resources, or that such conflicts can be mitigated.

The detailed procedures for determining oil and gas and coal development conflicts and for applying this planning constraint have been developed under Department of the Interior guidelines. Information on these procedures is available at the BLM Rock Springs District Office.

Determination: Competitive Federal coal areas covered by existing oil and gas leases are acceptable for further consideration for surface or subsurface coal mining and leasing, unless or until it is determined that coal development will interfere with producing oil and gas field operations or that such conflicts cannot be mitigated. If producing oil and gas fields are established in any of the competitive Federal coal areas before coal leases are issued, and if it is determined that unmitigable conflicts would exist between coal development and oil and gas operations, coal leasing would be deferred on the affected areas.

SURFACE OWNER CONSULTATION (SURFACE MINING)








This consultation requirement concerned only those private surface-Federal coal (split estate) lands in competitive coal areas that remained acceptable for surface coal mining after applying the coal unsuitability criteria and conducting the multiple-use conflict analysis. Since one of the surface owners consulted expressed a preference against surface mining the Federal coal under his land, about 0.2 million tons of coal will be unavailable for further consideration for leasing.

Note - Surface owner consultation does not apply to Federal surface - non-Federal coal areas or to competitive Federal coal areas where only subsurface mining is being considered.

COAL MANAGEMENT DECISIONS

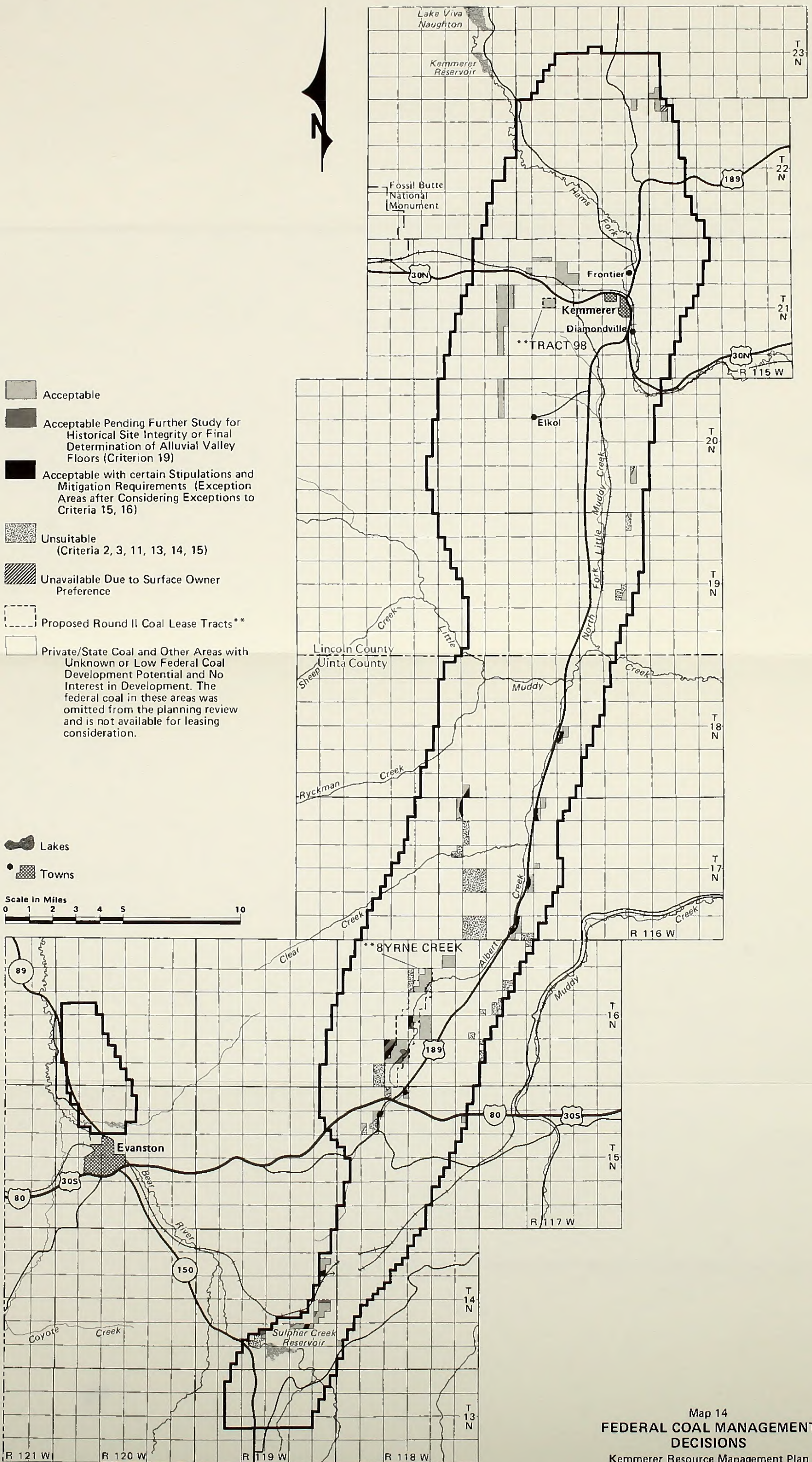
Table B-2-4 and Maps 13 and 14 contain the results of the coal screening process. These results were used to formulate the decisions presented below. The following Federal coal management decisions and the procedures used in their development are in accordance with the Mineral Leasing Act of 1920, the Federal Coal Leasing Amendments Act of 1976, the Federal Land Policy and Management Act of 1976, the Surface Mining Control and Reclamation Act of 1977, the Federal Coal Management Program adopted by the Secretary of the Interior in June 1979, and all relevant Federal regulations.

The proposed coal management decisions for the Kemmerer Resource Area were issued on November 9, 1981. A public open house and hearing on the proposals were conducted on November 24, 1981, and the 30-day comment period ended on December 9, 1981. During and following the comment period, surface-owner consultation and formal consultation with Wyoming State Government on certain of the coal unsuitability criteria were completed. The records of these public involvement and consultation activities are on file for public viewing at the BLM

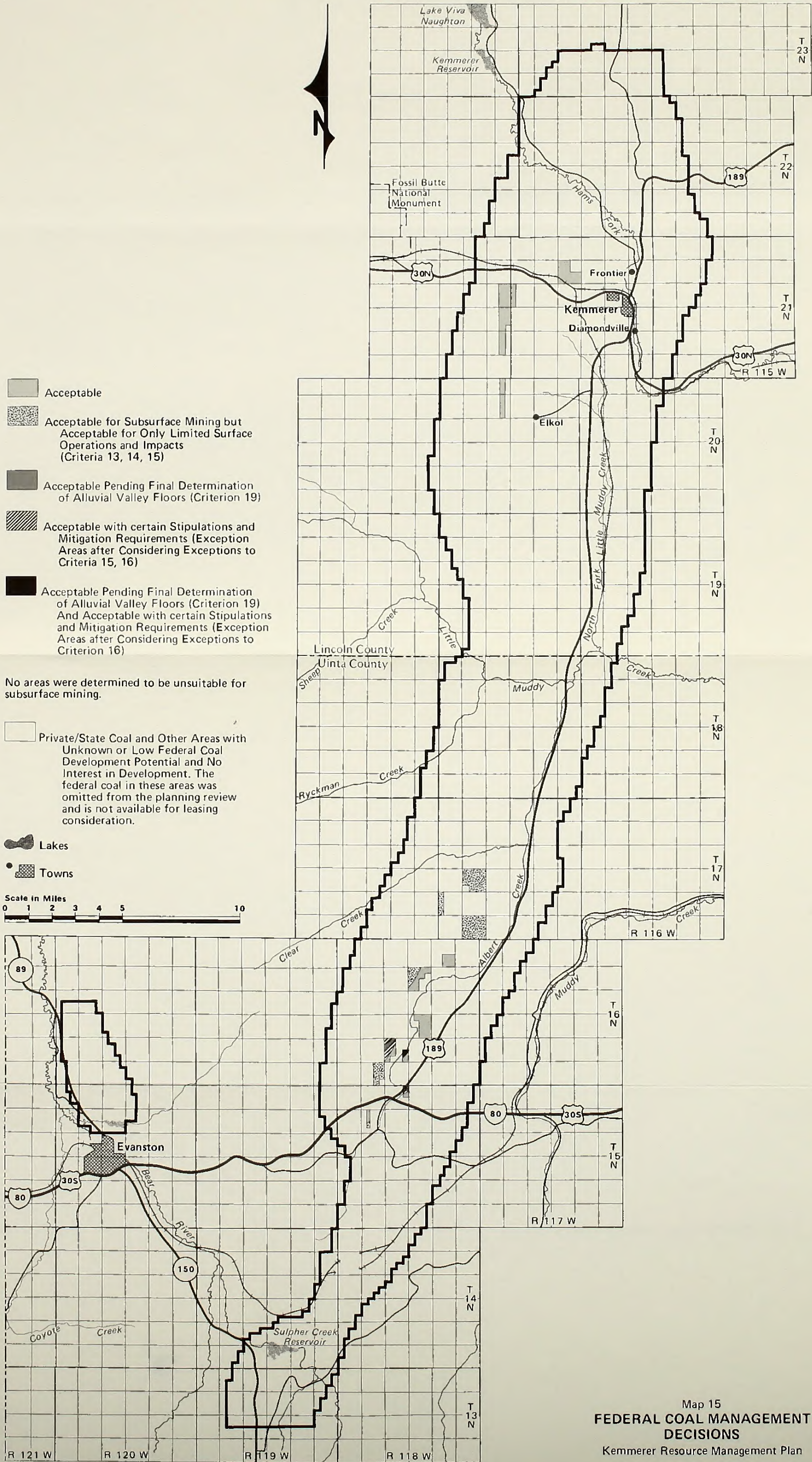
-  Acceptable
-  Acceptable Pending Further Study for Historical Site Integrity or Final Determination of Alluvial Valley Floors (Criterion 19)
-  Acceptable with certain Stipulations and Mitigation Requirements (Exception Areas after Considering Exceptions to Criteria 15, 16)
-  Unsuitable (Criteria 2, 3, 11, 13, 14, 15)
-  Unavailable Due to Surface Owner Preference
-  Proposed Round II Coal Lease Tracts**
-  Private/State Coal and Other Areas with Unknown or Low Federal Coal Development Potential and No Interest in Development. The federal coal in these areas was omitted from the planning review and is not available for leasing consideration.

-  Lakes
-  Towns

Scale in Miles
0 1 2 3 4 5 10



Map 14
FEDERAL COAL MANAGEMENT DECISIONS
Kemmerer Resource Management Plan



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Rock Springs District and KRA offices. In summary, these activities raised the following issues and concerns regarding the proposed decisions:

- Apparent procedural inconsistencies between BLM offices in applying some of the coal unsuitability criteria and related errors in identifying areas as unsuitable or acceptable for coal development. — Determinations of floodplain areas (Criterion No. 16) to be unsuitable for coal development on the basis of insufficient data and incomplete procedure.
- Premature determinations of alluvial valley floors (Criterion No. 19) to be unsuitable.
- Recommendations that areas of critical and sensitive wildlife values (Criteria No. 11, No. 13, No. 14, and No. 15) should be acceptable for coal development, rather than unsuitable, pending studies for capabilities of mitigation, reclamation, etc.
- Premature determinations of historic cultural sites (Criterion No. 7) to be unsuitable.

The proposed decisions were re-evaluated on the basis of the public comments and consultation information obtained and the final Federal coal management decisions for the KRA were developed accordingly. Since this is a summary, the decisions presented reflect only the results of the final analysis. The detailed information, rationale, and analyses that resulted in either changing or not changing some of the proposed decisions are available for viewing and discussion at the BLM Rock Springs District and KRA Offices.

The net effect of the updated coal planning review of the 1982 amendment coal decisions resulted in no change to those decisions. In view of this and the analysis of the alternatives considered in the coal planning review, the following decisions for managing the Federal coal resource in the KRA were incorporated in the RMP as part of the "Management Common to all Alternatives."

1. For identified competitive Federal coal areas with surface mining potential within the Kemmerer Resource Area:
 - a. About 5,800 acres containing approximately 25 million tons of coal are acceptable for coal development by surface mining methods.
 - b. About 1,340 acres containing approximately 5.7 million tons of coal are acceptable for coal development by surface mining methods, with certain stipulations and mitigation requirements.

- c. About 390 acres containing approximately 1.7 million tons of coal are acceptable for further consideration for coal development by surface mining methods, pending studies to be made at the time of mine and reclamation planning and permitting (i.e., if coal leases are issued on the areas) for determining (1) historic site integrity and buffer zones; and (2) final determination of alluvial valley floors.

The above areas (a, b, c) will be given further consideration for new competitive leasing, emergency leasing, lease modifications and exchange proposals under the Federal Coal Management Program.

- d. About 40 acres of privately owned land containing approximately 0.2 million tons of Federally owned coal are unavailable for further consideration for leasing due to surface owners preference against surface mining the coal under their lands.
2. For identified competitive Federal coal areas with subsurface mining potential within the KRA:
 - a. About 4,800 acres containing approximately 33 million tons of coal are acceptable for coal development by subsurface mining methods.
 - b. About 1,891 acres are only acceptable for limited surface operations (i.e., subject to restrictive types and placement of facilities, seasonal restrictions, etc.).
 - c. About 53 acres containing approximately 0.4 million tons of coal are acceptable for further consideration for coal development by subsurface mining methods, and for related surface operations and impacts, pending studies to be made at the time of mine and reclamation planning and permitting (i.e., if coal leases are issued on the areas) for final determination of alluvial valley floors.
 - d. About 940 acres are acceptable for the surface operations and impacts associated with subsurface mining, with certain stipulations and mitigation requirements.

The above areas (a, b, c, d) will be given further consideration for new competitive leasing, emergency leasing, lease modifications, and exchange proposals under the Federal Coal Management Program.
3. In the event that producing oil and gas fields are established in competitive Federal coal areas (both surface and subsurface mining areas), before the coal is leased, defer coal leasing in such areas, unless or until it is

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determined that coal development will not interfere with oil and gas operations or that such conflicts can be mitigated.

4. For areas of Federal surface ownership over non-Federal coal ownership that were not considered in this planning effort, the coal unsuitability review and multiple-use conflict evaluation requirements will be conducted on a case-by-case basis, should the coal be considered for leasing or as mining and reclamation plans are submitted.
5. Keep the entire KRA open to coal resource inventory and exploration to aid in the identification of coal resources and their development potential. The conduct of exploration activities will be allowed only in a manner consistent with all current planning decisions and with appropriate stipulations to protect other resources.
6. Pursue study needs through consultation with the Wyoming State Historic Preservation Officer (SHPO), to determine the eligibility of the Bear River City Historic Site for listing in the National Register of Historic Places.

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OIL AND GAS FIELDS

Producing Wells	1982 Production	
	Oil	Gas
Anshutz Ranch East (1)	9,674	162,467
Aspen (1)	1,024	0
Big Dry Creek (1)	3,467	46,542
Black Jack (2)	1,265	73,120
Bruff (57)	88,133	15,298,624
Butcher Knife Springs (3)	65,035	686,107
Chicken Creek (0)	0	0
Church Buttes (23)	3,276	7,521,969
Clear Creek (4)	190,384	2,073,165
Craven Creek (7)	134	47,156
Emigrant Springs (5)	2,867	197,521
Glasscock Hollow (3)	143,239	649,675
Henry (2)	101,298	2,521,764
Hickey Mountain	3,847	0
Horse Trap (0)	0	0
Moxa (2)	0	256,077
Opal (2)	151	23,501
Opal Bench (0)	0	0
Painter Reservoir (54)	5,083,915	29,6033,298
Pipeline Crossing (4)	208	64,594
Red Canyon (0)	0	0
Road Hollow (0)	0	0
Roads (1)	879	0
Ryckman Creek (31)	1,247,396	7,768,228
Session Mountain (0)	0	0
Sevenmile Gulch (6)	8,557	715,556
Shurtleff (1)	10,045	31,303
Shute Creek (5)	6,068	242,812
Spring Valley (7)	852	0
Storm Shelter (16)	20,238	896,911
Stove Creek (3)	112	0
Sulphur Creek (0)	0	0
Sulphur Creek West (0)	0	0*
Thomas Canyon (0)	0	0*
Turtle Hill (1)	2,828	54,749
Vern (1)	314	60,940
Whiskey Butte (27)	20,192	3,124,985
Whitney Canyon/Carter Creek (13)	57,952	1,452,028
Wild Hare Gulch (4)	12,718	561,212
Willow Creek (1)	0	9,866
Wilson Ranch (13)	16,154	1,913,233
Woodruff Narrows (0)	0	0
Yellow Creek (21)	146,398	971,833
(323)	7,248,620**	77,029,236***

* Shut in

** Oil (measured in barrels)

*** (measured in thousand cubic feet)

APPENDIX C

EROSION CONTROL, REVEGETATION AND RESTORATION PLAN (ERRP)

The purpose of developing an ERRP is to allow for cooperative innovation in reclamation of a disturbed area to a predetermined land use for wellfield and treatment plant activities. The following is an outline of topics to be covered in an ERRP. All ERRPs must address these points but they are not limited to them. Although the ERRP is a formal document, amendments can be approved by the Authorizing Officer.

I. INTRODUCTION

Clear Identification of Reclamation Goal

This is to be identified by the Federal Land Management (FLM) agency concerned and should include specific goals for percent perennial cover and species diversity expected for successful reclamation. Predisturbance cover would be used as a guideline for establishing goals.

Short description of activity causing disturbance and project timeframes.

Proposed Start Date
Duration of Project
Completion Date
End of Project Life (Estimate)

Set timeframes for ERRP

Seasonal reviews to initiate change
When plan will be considered implemented

II. OBLIGATION

Exactly who (individual name, address, phone) is responsible for what in the:

Design of Plan¹
Execution of Plan¹
Monitoring of Progress¹

III. SITE MAP FOR PROJECT² TO INCLUDE:

Soil Descriptions and Boundaries Symbols

Rock Outcrop
Photo Record Point
Springs and Wet Spots

Location and Volume of Proposed Material Stockpiles

Time Material Will Be Stored
Type of Material in Pile

Identify Existing Drainage Patterns

Identify Existing Vegetative Cover

Identify Existing ORV or Two-Track Roads

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IV. ZERO RUNOFF

All disturbed sites, except linear rights-of-way, will maintain zero runoff³ until the area is stabilized. Stabilization⁴ will be a value that must be clearly defined in the plan.

The AO can approve a variance from zero runoff based on detailed site specific analysis that would consider meteorology, topography, water quality, and special site design and/of construction measures.

V. EROSION CONTROL MEASURES

Description of Proposed Measures

Identify levels of runoff planned for, i.e.: 50 year storm, etc.

Include capacity of all retention structures and engineering design.

Map locating erosion control measures placement

Include Zero Runoff Measures

VI. FUGITIVE DUST CONTROL

Watering or other approved dust abatement procedures will be done to prevent severe wind erosion and loss of soil materials during construction.

Describe

How and When

VII. EVEGETATION

Type

Seed

Established Stock

Site Preparation

Planting

Planting Timeframes

Planting Method and Equipment

Fertilization Program

Rationale for Fertilizing or Not Fertilizing

VIII. MONITORING SITE RECLAMATION PROGRESS

Methods

Timeframes

Photo Record Station (with location) of Site Pre-disturbance

IX. SITE ABANDONMENT

Include Timeframes

X. POTENTIAL PROBLEMS

APPENDIX C

Address Possible Weak Points

Erosion

Slumping

ORV Use (i.e., cover points that might conflict over ERRP implementation with area land use goals)

Snow (management)

Company Fire Policy (weed control) Vs. Vegetation Management Goals

¹An experienced and trained professional (i.e. soil scientist, reclamation specialist) that has been approved by the Authorized Officer (AO) is required to prepare and lead the implementation and monitoring of this plan.

²This information should not just cover the proposed disturbed area but should extend beyond site boundaries by approximately 150 yards.

³Zero runoff for purposes of the ERRP means: No portion of natural or man-caused liquid will leave the disturbed area by either surface or sub-surface flow.

⁴Stabilization for purposes of the ERRP is to mean: That point in time when neither erosion nor deposition occurs which is greater than pre-disturbance. This point must be measurable (site monitoring) and self-sustaining, i.e., not dependent on site maintenance.

APPENDIX D

LANDS IDENTIFIED FOR DISPOSAL

Range 110

T. 18 N., R. 110 W.
Sec. 14: All

Range 111

T. 18 N., R. 111 W.
Sec. 14: All

T. 19 N., R. 111 W.
Sec. 28: SE

Range 112

T. 20 N., R. 112 W.
Sec. 20: SE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 28: N $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$,
E $\frac{1}{2}$ SE $\frac{1}{4}$

T. 22 N., R. 112 W.
Sec. 14: All
Sec. 18: All

T. 23 N., R. 112 W.
Sec. 12: SESWSW, SWSESE
Sec. 13: NENWNE, NWNENE

T. 26 N., R. 112 W.
Sec. 6: Lots 3, 4, 5, 9, and 12 to 29 inclusive
Sec. 7: Lot 5

Range 113

T. 21 N., R. 113 W.
Sec. 16: Lots 1 to 7 inclusive
Sec. 20: Lots 1 to 4 inclusive, and 6 to 10
inclusive
Sec. 30: Lot 2

Range 114

T. 16 N., R. 114 W.
Sec. 28: NW $\frac{1}{4}$ NW $\frac{1}{4}$

T. 21 N., R. 114 W.
Sec. 25: Lots 1, 2, 3
Sec. 26: Lots 1, 2, 3, 4, 6, 7
Sec. 27: Lots 2, 3
Sec. 28: Lots 1, 2, 3, 4, 5, 6, 7, NE $\frac{1}{4}$ NW $\frac{1}{4}$,
N $\frac{1}{2}$ NE $\frac{1}{4}$

Range 115

T. 14 N., R. 115 W.
Sec. 20: SE $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 22: SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$
Sec. 29: NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ E $\frac{1}{2}$

T. 15 N., R. 115 W.
Sec. 7: Lot 2
Sec. 31: SE $\frac{1}{4}$ NE $\frac{1}{4}$

T. 16 N., R. 115 W.
Sec. 29: NW $\frac{1}{4}$ NE $\frac{1}{4}$

T. 21 N., R. 115 W.

Sec. 18: SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 19: Lots 2 and 3, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$

T. 25 N., R. 115 W.

Sec. 18: Lot 1

Range 116

T. 14 N., R. 116 W.
Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7, S $\frac{1}{2}$ NE $\frac{1}{4}$,
SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$
Sec. 17: NW $\frac{1}{4}$ NE $\frac{1}{4}$
Sec. 21: SE $\frac{1}{4}$ SW $\frac{1}{4}$
Sec. 29: Lot 1

T. 15 N., R. 116 W.

Sec. 8: Lots 5, 7, 8
Sec. 11: NW $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 12: NW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 15: W $\frac{1}{2}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$,
NW $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 16: NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 20: Lots 5 to 8 inclusive
Sec. 21: NW $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 22: NE $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 23: SE $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 25: N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 26: E $\frac{1}{2}$ NE $\frac{1}{4}$
Sec. 27: NW $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 32: Lots 5 to 8 inclusive

T. 20 N., R. 116 W.

Sec. 4: Lot 1

T. 21 N., R. 116 W.

Sec. 17: Tracts 98A, 98B, 98C, 98D
Sec. 24: Lots 3, 4, 5, 6, 7, 8
Sec. 25: Lots 1, 2, 4, 5 T. 22 N., R. 116 W.
Sec. 11: Tract 62, Lots 7, 10, 15, 21, Tract
57, Lot 20
Sec. 13: Lots 19, 20
Sec. 14: Tract 57, Lots 4, 9
Sec. 24: Lot 11

T. 23 N., R. 116 W.

Sec. 25: Lot 2, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$,
NW $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 26: Lot 2
Sec. 35: NW $\frac{1}{4}$ NW $\frac{1}{4}$

T. 25 N., R. 116 W.

Sec. 1: Lots 6, 7, 8

APPENDIX D

Range 117

T. 13 N., R. 117 W.

Sec. 4: Lots 2, 3, 4, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$

Sec. 6: Lot 1, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$

Sec. 8: SE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$

T. 14 N., R. 117 W.

Sec. 2: Lots 1, 2, 3, 4, S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$

Sec. 4: Lots 3, 4, S $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$

Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$

Sec. 10: All

Sec. 12: N $\frac{1}{2}$

Sec. 20: E $\frac{1}{2}$

Sec. 24: All

Sec. 26: All

Sec. 28: All

Sec. 30: E $\frac{1}{2}$ SE $\frac{1}{4}$

T. 15 N., R. 117 W.

Sec. 8: All

Sec. 12: NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$

Sec. 14: W $\frac{1}{2}$

Sec. 18: Lots 1, 2, 3, 4, E $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$

Sec. 20: All

Sec. 22: All

Sec. 24: N $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ S $\frac{1}{2}$

Sec. 26: All

Sec. 28: W $\frac{1}{2}$ W $\frac{1}{2}$

Sec. 30: Lots 1, 2, 3, 4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$

Sec. 32: S $\frac{1}{2}$

Sec. 34: All

T. 22 N., R. 117 W.

Sec. 1: Lots 9, 10, 11

Sec. 12: Lot 1 T. 23 N., R. 117 W.

Sec. 3: Lots 7, 10

Sec. 15: Lot 4

Sec. 22: E $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$

T. 24 N., R. 117 W.

Sec. 2: Lots 6, 8, 9, 13, 16, 17, 18, 19

Sec. 3: Lots 5, 6, 7, 8

Sec. 4: Lots 5, 10, 12, 13

Sec. 10: Lot 1

Sec. 30: Lots 6, 7, 9, 15

Sec. 35: Lot 7

Range 118

T. 13 N., R. 118 W.

Sec. 4: Lots 3, 4, S $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$

Sec. 6: Lots 3, 4, 5, 6

Sec. 8: NE $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$

Sec. 10: All

Sec. 14: E $\frac{1}{2}$, W $\frac{1}{2}$ W $\frac{1}{2}$

Sec. 18: E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$

Sec. 20: E $\frac{1}{2}$

Sec. 32: SW $\frac{1}{4}$

T. 14 N., R. 118 W.

Sec. 2: Lots 1, 2, 3, 4, S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$

Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$

Sec. 8: W $\frac{1}{2}$ /E $\frac{1}{2}$, NW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$

Sec. 12: N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$

Sec. 18: Lots 1, 2, 3, 4, NE $\frac{1}{4}$, E $\frac{1}{2}$ W $\frac{1}{2}$

Sec. 20: All

Sec. 22: All

Sec. 28: All

Sec. 30: N $\frac{1}{2}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$

T. 15 N., R. 118 W.

Sec. 4: Lots 1, 4, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$

Sec. 10: N $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$, S $\frac{1}{2}$ SE $\frac{1}{4}$

Sec. 12: SE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$

Sec. 14: NW $\frac{1}{4}$

Sec. 18: Lots 1, 2, 3, E $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$

Sec. 20: All

Sec. 22: NE $\frac{1}{4}$, W $\frac{1}{2}$

Sec. 26: NE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$

Sec. 28: All

Sec. 30: E $\frac{1}{2}$ E $\frac{1}{2}$

Sec. 32: All

Sec. 34: NE $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$

Sec. 36: All T. 24 N., R. 118 W.

Sec. 30: Lot 7

T. 25 N., R. 118 W.

Sec. 19: Lot 38

Sec. 20: Lot 33

Range 119

T. 12 N., R. 119 W.

Sec. 2: Lot 1, SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$

Sec. 12: W $\frac{1}{2}$ W $\frac{1}{2}$

Sec. 14: E $\frac{1}{2}$ E $\frac{1}{2}$

Sec. 20: Lot 4

Sec. 24: Lot 4, NW $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$

T. 13 N., R. 119 W.

Sec. 2: Lots 1, 2, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$

Sec. 6: S $\frac{1}{2}$ SE $\frac{1}{4}$

Sec. 8: W $\frac{1}{2}$, W $\frac{1}{2}$ E $\frac{1}{2}$

Sec. 24: W $\frac{1}{2}$ W $\frac{1}{2}$

Sec. 32: SW $\frac{1}{4}$

T. 14 N., R. 119 W.

Sec. 4: Lots 1, 2, 3, 4, S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$

Sec. 6: Lots 6, 7, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$

Sec. 8: N $\frac{1}{2}$, SE $\frac{1}{4}$

Sec. 10: E $\frac{1}{2}$ E $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$

Sec. 12: W $\frac{1}{2}$ W $\frac{1}{2}$

Sec. 14: All

Sec. 20: E $\frac{1}{2}$ E $\frac{1}{2}$

Sec. 22: All

Sec. 24: All

Sec. 26: All

Sec. 28: N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$

Sec. 35: Lots 9, 10, 11

T. 15 N., R. 119 W.

Sec. 12: All

APPENDIX D

Sec. 14: All
Sec. 24: SW $\frac{1}{4}$
Sec. 26: All
Sec. 32: N $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$, E $\frac{1}{2}$ SE $\frac{1}{4}$

T. 19 N., R. 119 W.
Sec. 28: N $\frac{1}{2}$ SE $\frac{1}{4}$
Sec. 34: NE $\frac{1}{4}$ NW $\frac{1}{4}$

T. 22 N., R. 119 W.
Sec. 8: Lot 31
Sec. 17: S $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, Tract 40, Lots 6, 7, 8 T. 24 N., R. 119 W.
Sec. 1: Tract 98, Lots 6, 16
Sec. 2: Tract 98, Lots 5, 20, 38
Sec. 3: Lots 36, 38, 40, 45, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, Tract 94, Lots 35, 44
Sec. 4: Lots 36, 37, 40, 45, Tract 91, Lots 28, 29, 41, 42, 46, 52, Tract 94, Lots 43, 44
Sec. 9: Lots 1, 4, 18, 19, 30, 31, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, Tract 91, Lots 2, 3, 6
Sec. 10: Lot 1, NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$
Sec. 11: SW $\frac{1}{4}$ SW $\frac{1}{4}$
Sec. 14: Lot 9, W $\frac{1}{2}$ NW $\frac{1}{4}$
Sec. 15: Lots 1, 4, 5, 8, NE $\frac{1}{4}$, E $\frac{1}{2}$ W $\frac{1}{2}$, N $\frac{1}{2}$ SE $\frac{1}{4}$
Sec. 16: Lot 23
Sec. 19: Lots 7, 8, E $\frac{1}{2}$ SW $\frac{1}{4}$
Sec. 20: Lot 28
Sec. 21: Lots 1, 19
Sec. 22: Lots 1, 2, N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 24: Lots 10, 11, 12, SW $\frac{1}{4}$ SW $\frac{1}{4}$
Sec. 25: Lots 3, 27, 28, 29, 30 N $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$
Sec. 26: Lots 11, 14, 15, 16, 17, 18, 19
Sec. 29: Lots 6, 21
Sec. 35: Lots 1, 4, 6, 26, 27, NE $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 36: Lots 5, 6

T. 25 N., R. 119 W.
Sec. 6: Lots 25, 26
Sec. 22: Tract 75, Lots 16, 26, Lot 27
Sec. 27: Lot 4
Sec. 29: Lots 26, 27, Tract 52, Lots 21, 23, 25, 28, 29, 31
Sec. 30: Lots 20, 25, Tract 52, Lot 26
Sec. 32: Tract 52, Lot 6

T. 27 N., R. 119 W.
Sec. 18: W $\frac{1}{2}$ W $\frac{1}{2}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 19: W $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$

Range 120

T. 14 N., R. 120 W.
Sec. 4: Lots 1 to 4 inclusive, S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$
Sec. 8: S $\frac{1}{2}$
Sec. 10: E $\frac{1}{2}$ E $\frac{1}{2}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 14: All
Sec. 20: All
Sec. 24: N $\frac{1}{2}$, SW $\frac{1}{4}$

Sec. 26: NE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$
Sec. 28: S $\frac{1}{2}$
Sec. 30: S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$

T. 15 N., R. 120 W.
Sec. 10: W $\frac{1}{2}$ NW $\frac{1}{4}$ T. 21 N., R. 120 W.
Sec. 3: Lots 10, 11
Sec. 4: Lot 5

T. 22 N., R. 120 W.
Sec. 15: Lot 4

T. 23 N., R. 120 W.
Sec. 25: Lot 28
Sec. 36: Lots 23, 24, 25, 26

T. 24 N., R. 120 W.
Sec. 1: Lots 45, 46

Range 121

T. 13 N., R. 121 W.
Sec. 2: Lot 1
Sec. 10: Lots 2, 3
Sec. 12: NE $\frac{1}{4}$ NE $\frac{1}{4}$
Sec. 24: NW $\frac{1}{4}$ SE $\frac{1}{4}$

T. 14 N., R. 121 W.
Sec. 12: NW $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 24: S $\frac{1}{2}$ SE $\frac{1}{4}$
Sec. 26: NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ S $\frac{1}{2}$

T. 15 N., R. 121 W.
Sec. 2: Lots 1, 2, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$
Sec. 11: E $\frac{1}{2}$
Sec. 14: N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 23: E $\frac{1}{2}$
Sec. 34: Lots 1 to 4 inclusive

T. 16 N., R. 121 W.
Sec. 2: Lot 4, SW $\frac{1}{4}$ NW $\frac{1}{4}$
Sec. 10: Lots 1, 2, 3, 4
Sec. 12: E $\frac{1}{2}$ SE $\frac{1}{4}$
Sec. 23: E $\frac{1}{2}$
Sec. 26: SE $\frac{1}{4}$
Sec. 35: E $\frac{1}{2}$

Star Valley Lands Identified for Disposal

Range 1184FL

T. 30 N., R. 118 W.
Sec. 21: Lot 1
Sec. 28: Lot 1, E $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$
Sec. 33: SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, Lot 1
Sec. 5: Lot 4

T. 31 N., R. 118 W.
Sec. 18: Lots 1, 2, 3, 4, W $\frac{1}{2}$ NE $\frac{1}{4}$
Sec. 19: Lot 1

T. 32 N., R. 118 W.
Sec. 31: E $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$

T. 33 N., R. 118 W.

Sec. 7: E $\frac{1}{2}$ SE $\frac{1}{4}$

Sec. 8: S $\frac{1}{2}$

Sec. 9: S $\frac{1}{2}$ SW $\frac{1}{4}$

Sec. 11: E $\frac{1}{2}$ NW $\frac{1}{4}$

Sec. 28: E $\frac{1}{2}$ SW $\frac{1}{4}$

T. 34 N., R. 118 W.

Sec. 5: Lots 1, 5, 6, 9

Sec. 6: SE $\frac{1}{4}$ NE $\frac{1}{4}$

Sec. 27: Lots 2, 3

Sec. 28: E $\frac{1}{2}$ NE $\frac{1}{4}$

Range 119

T. 30 N., R. 119 W.

Sec. 2: NE $\frac{1}{4}$ SE $\frac{1}{4}$

Sec. 11: S $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$

Sec. 12: SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$

T. 31 N., R. 119 W.

Sec. 6: Lots 4, 5, 6

Sec. 7: Lots 1, 4

Sec. 8: Lots 7, 8, SE $\frac{1}{4}$ SE $\frac{1}{4}$

Sec. 9: SW $\frac{1}{4}$ SW $\frac{1}{4}$

Sec. 17: Lot 7

Sec. 18: Lot 8 (reconveyed U.S.)

Sec. 20: E $\frac{1}{2}$ SE $\frac{1}{4}$

Sec. 21: W $\frac{1}{2}$ SW $\frac{1}{4}$

T. 33 N., R. 119 W.

Sec. 2: Lot 2, SE $\frac{1}{4}$ NE $\frac{1}{4}$

Sec. 33: Lots 1, 2, 3, 4 T. 34 N., R. 119 W.

Sec. 15: SW $\frac{1}{4}$ SW $\frac{1}{4}$

Sec. 22: Lots 3, 4, 5

Sec. 35: Lots 1, 2, 3, 8, 9, NE $\frac{1}{4}$ SW $\frac{1}{4}$

T. 36 N., R. 119 W.

Sec. 14: SE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$

Sec. 24: E $\frac{1}{2}$ E $\frac{1}{2}$

Sec. 25: NE $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$

Appendix E-1

FIRE MANAGEMENT AREAS

Area No. 1

This area is in the extreme northwest portion of the Resource Area (Map 8) and includes areas of the Thomas Fork, upper Smiths Fork, and upper Hams Fork drainages. It is bordered almost exclusively on the north by Bridger-Teton National Forest lands. Elevation ranges from 6,000 to 8,000 feet with very rough topography and many slopes in excess of 50 percent.

Access routes are either low standard roads or two-track trails and are located primarily on ridge tops or in canyon bottoms.

Vegetation is primarily sagebrush-grass, but there are many reasonably contiguous blocks of conifer forest over 300 acres in size, above 7,000 feet. Aspen patches are common midslope throughout the area.

Fires in this area occur from mid-June to mid-September and are infrequent, with slightly less than one fire per year reported on a 10-year average basis. Other unreported fires have occurred which generally run to the top of the ridges and burn out during dry years. Extreme burning conditions are not expected in the absence of strong winds, unless a fire develops with the intensity to pre-dry heavy fuels.

Past grazing management practices greatly reduced the fire fuel availability during the fire season and it is assumed this limited the fire size. The implementation of current grazing practices is increasing the amount of fire fuel available in some parts of the area.

This increase in fire fuels, combined with the near-total absence of large fires, will result in fuel conditions which, when combined with the steep topography, can develop into a large fire situation. Control lines should almost exclusively be placed on ridge tops. These control lines will be reinforced in many areas by natural fuel breaks such as streams, or areas which need only a minor amount of work to establish an acceptable fuel break. Potential exists in this area for the use of small prescribed burns for vegetative conversion or hazard reduction.

Area No. 2

The area generally covers the northern portion of the Resource Area (Map 8) with the exception of Area No. 1 previously described. Generally, elevations range from 7,000 to 8,000 feet. Topography is generally rolling, although there are many localized areas of steep slopes in excess of 50 percent. The Commissary Ridge area in the western portion of Area No. 2 is also steep and rugged and has many of the characteristics described in Area No. 1. Vegetation is primarily sagebrush with small aspen patches (generally less than 100 acres) common throughout much of the area. Small patches of conifers are scattered throughout the area. This is the most vegetatively productive area in the Resource Area, with grazing capacities in the 5 acre/AUM range. Fire has not played a significant role in this area recently, due primarily to prompt detection and suppression action.

This area has extremely high fuel concentrations in some places, but slope conditions generally favor the use of fire, both management fires (wildfire allowed to burn within management guidelines) and prescribed burns, as a management tool under tightly controlled conditions. Evaluation of past wildfires and prescribed burning in the area verify that fire, under the proper conditions, has desirable results in this area.

A relatively small area consisting of 13,160 acres (7,560 Federal, 4,400 private, and 1,200 State) lies within the State of Idaho but is included in the KRA. Relatively large wildfires have developed in this area in the past, with few adverse effects evident. The vegetation is primarily sagebrush-grass with a few small patches of aspen and mountain mahogany.

Area No. 3

The main physical feature in this small area is the Green River which generally runs along its east boundary. Elevation is 6,200 to 6,300 feet.

Appendix E-1

Major vegetation types are cottonwood and willow, mixed with sub-irrigated grassland.

Greasewood, saltsage, and sagebrush-grass areas comprise the vegetation on the west side of the area. Fires, generally man-caused, have been common in the area, but have only been a real problem when associated with high winds, which are common in this area. Land ownership is mixed in the area with the Seedska-dee National Wildlife Refuge controlling a large portion. Private ranches and meadows are also interspersed throughout. Private improvements, waterfowl habitat, and some developed picnic/camping areas are the major economic values. Opportunities may exist for habitat improvement, however, this should be at the initiative of the Seedska-dee National Wildlife Refuge.

Area No. 4

The area is a high upland area between the Green River on the east and Kemmerer on the west. Topography is flat to rolling with an average elevation of 6,500 feet. Sagebrush-grass dominates the area particularly on the higher sites. Significant amounts of greasewood are present on the denser soils along ephemeral streams. Saltsage is interspersed throughout the area. Available fuels and topography is such that fire is not a problem, unless fanned by extreme winds.

Area No. 4-A

This is a small area of predominantly Federal range bounded on the west by private lands in Bridger Valley and on the northeast by the checkerboard boundary south and east of Church Buttes. The physical characteristics of this area are very similar to Area No. 4 with the major difference being the geographic location.

Area No. 5

This large area comprises all of the checkerboard ownership in the Resource Area, with the exception of the Cumberland Unit or Overthrust Belt on the extreme west side of the Resource Area (Area No. 6). Area No. 5 is comprised of slightly over 50 percent private land. This is primarily undeveloped grazing land, except for scattered hay meadows and ranch headquarters along perennial streams. Elevation averages 6,500 feet and vegetation is similar to

Area No. 4, with sagebrush-grass, saltsage, and greasewood. Topography is generally flat to rolling.

Oil and gas exploration and production is significant in the area with developed fields in the Granger and Church Buttes areas, and sour gas plants at Church Buttes and Butcher Knife Draw. Exploration activity is common throughout the area. The Union Pacific Railroad mainline crosses the area in an east-west direction.

Area No. 6

This is the checkerboard portion of the Cumberland Unit located on the extreme west side of the Resource Area (Map 8). Elevation ranges from 6,500 to 8,000 feet with canyons running east and west off the Bear River Divide. Topography varies from flat on the extreme east side, to slopes in excess of 50 percent on some of the canyon sides. Access has traditionally been through the canyon bottoms and along the Bear River Divide.

Vegetation is primarily sagebrush-grass with areas of greasewood and saltsage at the lower elevations, and areas of stunted aspen, snowberry, and mountain mahogany at the higher elevations. Small ponds and springs are common throughout much of the area.

A major feature of the area at present is the rapidly expanding oil and gas exploration and production. Drilling is occurring year-round and several major gas treatment plants are planned for construction. The investment in man-made facilities and the resultant man-induced hazards, i.e., diesel fuel in reserve pits, gas valves, etc.

The opportunity for use of management fires and prescribed burns exists in this area, both from the hazard reduction and forage conversion standpoints.

Area No. 7

This area is in the western portion of the Resource Area and is bounded by the Utah State line on the west, U.S. Highway 189 on the east, U.S. Highway 30 N. on the north, and the checkerboard boundary of Area No. 6 on the south. Elevation ranges from 6,500 to 8,000 feet with canyons running east and west off the Bear River Divide. The topography gradually slopes north to the Twin Creek drainage along U.S. Highway 30 North.

Vegetation is primarily sagebrush-grass with areas of aspen, snowberry, and mountain

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mahogany. Fires have traditionally occurred in this area but have not been a major factor in recent times.

Opportunities exist to use fire to achieve positive results under more optimum conditions.

Area No. 8

This small area is in the extreme southeast corner of the Resource Area, adjacent to the Wasatch National Forest and near the Utah State line. Elevation is approximately 7,000 feet. Vegetation is predominantly sagebrush-grass with large aspen patches, some of which cover several hundred acres. Some large conifer stands are also present. Timber sales have been proposed in the area which would require burning for slash disposal. Many of the aspen and conifer stands are over-mature and decadent. Opportunities exist for fire management in the timbered area, but much of this must be tied to the harvest of saw timber or large potential pole sale areas. Insect

and disease infestation have been identified in the conifers for the past 20 years. Fires have occurred in the area in the past but it has been many years since a large fire has occurred. The area appears to be quite fire resistant until optimum conditions would occur and then the fire would grow sufficiently large enough to carry itself. From the standpoints of hazard reduction and resource management, opportunities for fire management are extensive in this area.

Area No. 9

This area covers the Bridger Valley area west to Evanston (Map 8) and is generally the extreme southwestern portion of the Resource Area. Elevation ranges from 7,000 to 7,500 feet. The majority of the area is either privately owned irrigated areas or rangeland. BLM-administered land is fragmented, generally in small parcels, and many of these are under Section 15 lease. Isolated opportunities exist for forage conversion.

APPENDIX E-2

IMPACTS OF FIRE MANAGEMENT ON SEVERAL PLANT COMMUNITIES IN THE KRA

EAST SIDE

Most of the east side lies below 7,000 feet elevation and receives 7 to 9 inches of precipitation annually. Soils are shallow and generally unproductive. Dominant plant communities include sagebrush-grass, greasewood, rabbitbrush, desert shrub, and Utah juniper.

Sagebrush-grass Wyoming big sagebrush is the major shrub with thickspike wheatgrass, bottlebrush squirreltail, and Indian ricegrass in the understory. Crested wheatgrass has interseeded naturally in some areas. Big sagebrush is easily killed by fire regardless of season or fire severity, but summer fires are generally more detrimental to cool season grasses than spring or fall fires. Thickspike wheatgrass is usually unchanged immediately after fire but may double in 10 to 12 years. Bottlebrush squirreltail, often a precursor to bluebunch wheatgrass, is among the most fire resistant grasses; basal area may be reduced slightly by fires in June, July, and August, or anytime during a drouth year, but normally increases within 5 years. Indian ricegrass may be reduced on marginal sites but can increase dramatically on good sites with normal or above normal rainfall during the first post-burn year. Crested wheatgrass is unaffected by fire.

Greasewood Greasewood, big sagebrush, Nuttall saltbrush, and several species of horsebrush and rabbitbrush dominate the overstory. Annual forbs include halogeton and Russian thistle, both undesirable. Grasses include bottlebrush squirreltail and western wheatgrass, with desert saltgrass and foxtail barley on the more saline sites. The shrubs all sprout except big sagebrush. Both annual forbs usually increase after all, except late spring burns. Rhizomatous western wheatgrass may increase dramatically if soil moisture is adequate. Saltgrass is unaffected by burning but may be released from competition and, therefore, increase. In general, these communities should not be burned unless additional measures, such as chemical spraying or chemical fallow, are taken to control the undesirable sprouting shrubs and annual forbs. Greasewood can be toxic to livestock unless a gradual dietary adjustment period is provided. Halogeton is toxic to sheep. The toxicity of these plants to wildlife is unknown.

Rabbitbrush Rabbitbrush "communities" are small areas on disturbed sites. Extended (30 to 70 years) periods of fire exclusion and grazing management are necessary for successional recovery. If burned, rabbitbrush commonly increases 2- to 3-fold within 12 years. Thus, prescribed burning in communities containing rabbitbrush should be based on what amount of rabbitbrush cover is acceptable during the following 10 to 70 years. Severe fires may kill some rubber rabbitbrush (*C. nauseosus*), because it stem-sprouts rather than root-sprouts.

Desert Shrub These communities are dominated by spiny hopsage, big sagebrush, fourwing saltbrush, and horsebrush. Thickspike wheatgrass and Indian ricegrass are usually in the understory. These sites often lack sufficient fine fuel to carry fire, and may not return the cost of prescribed burning. Following wildfire, big sagebrush is the only shrub that does not sprout. The grasses generally increase but may be competitively reduced by horsebrush in 3 to 5 years.

Utah Juniper Utah Juniper, a non-sprouting species, is a climax plant on shallow, rocky sites where it is naturally protected from fire. These sites may burn under severe fire conditions if crown cover exceeds 40 percent. Where Utah juniper invades other sites, trees up to 4 feet tall can be killed if sufficient fine fuel is available near the trees. Larger trees are resistant to surface fires but may be killed by lightning. There is usually no benefit from burning climax sites, but wildlife habitat, watersheds, and livestock grazing capacity may benefit from burning invaded (seral) plant communities.

WEST SIDE

Elevational range on the west side of the KRA is greater, extending from about 6,000 feet to over 11,000 feet; this range is due to a series of north-south oriented ridges. Precipitation is correspondingly greater, varying from about 12 to 16 inches. Soils are shallow on the ridges but deeper and more productive in the valleys. Major plant communities include sagebrush-grass, aspen, mountain shrub, willow, conifer, dwarf sagebrush, one-seed juniper, greasewood, meadow, and crested wheatgrass seedlings. A

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cushion plant community (T&E) is located on Little Round Mountain.

Sagebrush-grass Basin big sagebrush, Wyoming big sagebrush, and mountain big sagebrush grow alone or in combinations. Commonly, basin big sagebrush grows on deeper soils, mountain big sagebrush is at higher elevations, and Wyoming big sagebrush occupies soils with a restricted layer such as duripan or rock. All three subspecies of big sagebrush are easily killed by fire, but mountain big sagebrush may reoccupy the site more quickly because seed germination is enhanced by heat. Several needlegrasses (subalpine, Letterman, and needle and thread) may be present; all are initially reduced by fire but recover, and production may increase over pre-burn levels in 10 to 12 years. Recent evidence (Smith, et al., 1984) suggests that green needlegrass is not harmed by fire in Wyoming. Season of burning and plant size are probable links to needlegrass damage; June and July fires are most damaging, and large plants are harmed more than small plants. Bluebunch wheatgrass is less sensitive to fire; it normally recovers within 2 years and may double pre-burn production within 5 years. Idaho fescue is normally severely reduced by summer wildfires, especially on marginal sites, but recent evidence (Britton, et al., 1983) indicates that damage from fall prescribed burns may be less than wildfire reports indicate. Basin wildrye and blue wildrye are retarded by early summer fires but unharmed by fall prescribed burns; a fall, 1983 prescribed burn west of Kemmerer resulted in wildrye greater than 6 feet tall, increased seed stalk production, and no apparent reduction in basal area by July 1984.

Aspen Aspen is a self-perpetuating climax plant on some sites but is probably seral to shade-tolerant conifers on most sites in the KRA. On seral sites, it is dependent on periodic fire or other disturbance to induce suckering and remove conifer competition. The general response to burning is an eruption of suckers (up to 30,000 or more per acre) for 1 to 3 years, after which suckering ceases and the clone begins to mature. On sites managed for wood products, aspen should be protected. On seral sites managed for wildlife habitat, topkilling with fire is necessary to stimulate accessible, high quality browse. Dr. Jim Brown (Northern Forest Fire Lab, Missoula) has investigated aspen response and techniques for burning different aspen habitat types in western Wyoming; a publication detailing that information is forthcoming in early spring, 1985.

Mountain Shrub A complex mountain shrub community occupies about 35,000 acres in the KRA. Dominant shrubs include mountain snowberry, antelope bitterbrush, Utah serviceberry, true mountainmahogany, curleaf mountainmahogany, and several species of currents. Understory species may include a rich mixture of forbs and thickspike wheatgrass, Idaho fescue, timothy, and mountain brome. Horsebrush, rabbitbrush, and broom snakeweed are minor components that usually increase after burning. These communities are temporarily (1 to 12 years) retrogressed by fire but the long term (10 to 30 years) effect is increased forage and browse production. Soil erosion problems, even on slopes greater than 40 percent, have not been reported in Wyoming. Of the more palatable shrubs, only antelope bitterbrush is usually harmed; however, the Rock Creek prescribed burn west of Kemmerer (September 1983) resulted in about 66 percent of the bitterbrush sprouting on that site. Most mountain shrub communities need protection from fire only where they exist as limiting, crucial winter range. Even then, planning will allow portions to be burned while reserving the remainder for immediate wildlife needs.

Willow Willow communities are usually riparian and not exposed to fire except during drouth years. Willow communities are extremely tolerant, however, and most sprout vigorously. Burning willows is detrimental only in that thermal cover is removed along streams, ponds, and reservoirs. Burned willow communities are attractive to moose and may be overbrowsed if small areas are burned or the moose population is large. Domestic livestock also abuse willow communities; therefore, willows may need protection for 1 to 3 years after burning to allow recovery.

Conifer Approximately 65,000 acres are classified as forestland and include lodgepole pine, Douglas-fir, limber pine, subalpine fir, white fir, and Englemann spruce; these trees may occur as relatively pure stands or as mixed stands. The true firs and limber pine are very sensitive to fire and are easily killed by cambial damage or crown scorch. Lodgepole pine, a recognized fire type, may be minor seral, dominant seral, persistent, or climax, depending on climatic, edaphic, and topographic conditions. Regardless of dominance, lodgepole becomes susceptible to mountain pine beetle attack, windthrow, and wildfire within 100 years of stand establishment. Lodgepole is very susceptible to stand-replacing fires, and is easily killed, but regenerates rapidly

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and prolifically. Douglas-fir is easily killed by fire in seeding through pole stages, but mature trees are extremely fire resistant. Englemann spruce and subalpine fir commonly occur together at elevations above 9,000 feet. They are both thin-barked and easily killed, but re-establish quickly on north-facing slopes. They may succeed initial establishment by aspen or Douglas-fir on south slopes.

Dwarf Sagebrush Common dwarf sagebrush communities consist of relatively pure stands of black sagebrush, alkali sagebrush, or low sagebrush. Various annual and perennial forbs are present as are Cusick and mutton bluegrass. These communities often do not support sufficient fine fuel or sagebrush cover to burn. If they do burn, all three sagebrush species are easily killed but grasses recover quickly. These sites usually are not productive and, therefore, are not good candidates for prescribed burning or rehabilitation after wildfires.

One-seed Juniper These communities often have a high frequency of lightning ignitions but lack of surface fuel prevents fire spread. Trees shorter than 4 feet are easily killed by surface fires if sufficient fuel is available at the base of the tree, but large trees are relatively fire resistant. Crown fires are possible when canopy cover exceeds 40 percent. One-seed juniper does not sprout.

Greasewood Localized saline areas support greasewood communities that may include fourwing saltbush and saltgrass. These communities are not of concern in fire protection and rarely produce cost-effective prescribed burns. Some decadent communities may benefit from fire, fire plus chemical sprout control, or fire plus reseeding. Seeding is risky, however, because few grass species are productive on these sites.

Meadows Wet meadows are often dominated by sedges and rushes, and may have inclusions of willow or aspen. Dry meadows often contain tufted hairgrass and several bluegrass species. There is seldom any benefit from burning wet meadows in western Wyoming although most are relatively fire resistant. Wet meadows may burn during dry years, and the temporary effect is a shift away from sedges and rushes toward grasses and forbs. Unless the water table is altered, wet meadows return to pre-burn conditions in 1 to 3 years. Dry meadows may be invaded by various woody species including silver sagebrush. These dry meadows benefit from periodic burning because woody plant encroachment is retarded. Dry meadows may be seral to shrublands and require periodic maintenance fires. Threadleaf sedge, which may occur in some meadows, is extremely

sensitive to fire, may require 12 to 15 years to recover, and can be eliminated by repeated burning in shorter intervals.

Crested Wheatgrass Seedings Because of Wyoming's favorable rainfall distribution pattern, areas that receive 12 inches or more of precipitation annually are rarely dry enough for crested wheatgrass to burn. Further, seedings that produce less than 600 pounds per acre are difficult to burn due to high silica content in crested wheatgrass stems and horizontal fuel discontinuity. Seedings may burn during late fall, however. On seedings that can be burned, fire is an excellent method to reduce woody plants and retard sagebrush reinvasion.

SUMMARY

Most plant communities in the KRA respond positively to burning. Sites that are in good to excellent range condition usually recover naturally to preburn conditions, with reduced cover of non-sprouting shrubs, in 1 to 3 years. Grazing and other uses can be resumed in 2 to 3 years. Many opportunities exist to take advantage of this positive response with spring and fall prescribed burns and with limited suppression of wildfires from natural ignitions. Further information on plant responses to burning can be found in published reports by Bartos (1979), Bartos and Mueggler (1979), Blaisdell, et al. (1982), Britton and Ralphs (1979), Brown and DeByle (1982), Kessell and Fischer (1981), Lotan, et al. (1978), Rowe (1983), Smith, et al. (1984), Wright and Bailey (1982), and Wright, et al. (1979). Additional information on resources in the KRA may be found in URAs, MFPs, the Fire Management Plan, and other documents in the Kemmerer Resource Area Office.

Appendix F

EXISTING TREND AND CONDITION OF STREAMS
AND RIPARIAN ZONES BASED ON A 1975-76 STREAM SURVEY 1/

Drainage Creek	Public Land Miles	Apparent Stream Habitat Trend(%)2/		Riparian Habitat Condition (%) 3/			
		Stable	Decl.	Good	Fair	Poor	None
THOMAS FORK	23.80	27	73	11	13	64	12
Coal	5.75		100		9	91	
E. Fork Coal	1.25		100			100	
Huff	3.85	16	84			100	
Little Muddy	5.00	48	52			100	
Raymond	1.50	67	33	67			33
N. Fork Raymond	0.70		100		100		
Trib "A"	1.50	100		100			
S. Fork Raymond	2.25	44	56				100
Salt	2.00		100		100		
SMITH'S FORK	23.90	31	69	34	31	25	10
First	0.25	0	100				100
Second	0.50	0	100			100	
Third	2.00	0	100		62	38	
Trib "A"	0.50	0	100		100		
Hobble	1.00	0	100		100		
Smith's Fork	4.20	0	100	100			
Trespass	1.00	0	100	100			
Coal	2.50	30	70		70	30	
Grade	1.00	100	0		100		
Sawmill	1.15	0	100			100	
Hawkins	1.25	20	80		60		40
Pine	1.75	57	43	29	29	42	
Porcupine	0.60	100	0		100		
Corral	0.40	0	100	100			
Muddy	2.05	100	0	100			
Mill	1.75	100	0				100
South Fork Mill	2.00	0	100			100	
BEAR RIVER	15.45	60	40	6	34	28	32
Bridger	0.10	100					100
Little Beaver	2.25	36	64		65	11	24
Clear	0.10	100			100		
Twin	8.65	54	46	7	20	28	45
Twin Ck. Ditch	0.25		100			100	
E. Fork Twin	1.30	69	31		69		31
S. Fork Twin	0.50	60	40	60		40	
N. Fork Twin	2.30	100			48	52	
HAM'S FORK	34.05	41	59	34	36	23	7
Lake	1.65	61	39	42	52	6	
Trib "A"	0.30		100				100
Wilkinson	0.60	100			50		50
Corral	1.10	100		100			
W. Fork Beaver	2.20	23	77	64	27		9
Carl	0.80	100			100		
Fenn	1.00		100			100	
Trail	4.10	37	63	12	51	37	

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Drainage Creek	Public Land Miles	Apparent Stream Habitat Trend(%) ^{2/}		Riparian Habitat Condition (%) ^{3/}			
		Stable	Decl.	Good	Fair	Poor	None
HAM'S FORK (cont.)				Trib "A" 0.10		100	100
Beaver	2.00	20	80	100			
Trib "A"	0.90		100		100		
Trib "B"	0.20		100	100			
W. Beaver	1.80	100		56		33	11
Dempsey	1.75	89	11		29		71
Trib "A"	0.40	100		100			
N. Fork Dempsey	1.70		100	100			
S. Fork Dempsey	0.70	100			100		
E. Fork Pole	2.35	100			100		
W. Willow	0.45	100			100		
W. Fork Hams	1.25	48	52	48	52		
Willow	2.05	12	88	64	24	12	
N. Willow	0.50		100			100	
Camp	2.90		100			100	
Fish	0.50		100		100		
Trib "A"	0.60		100	33	17	50	
Beaver Dam	0.70		100		100		
Robinson	1.25		100	24		76	
Trib "A"	0.20		100	100			
FONTENELLE	4.80	58	42	37	26	37	
Mahogany	0.20		100	100			
Rock	1.80	33	77			100	
Roney	2.80	79	21	57	43		
BLACK'S FORK	8.45	17	83	70	23	7	
W. Fork Smith's Fork	0.30		100	100			
E. Fork Smith's Fork	0.20		100	100			
Smith's Fork	0.70		100	100			
Fish	0.90	100		100			
Little W. Fork	0.50	100		100			
Black's Fork	0.60		100	100			
Horse	2.65		100	68	32		
Willow	2.60		100	35	42	23	

^{1/} The 1975-76 stream survey is on file at the Kemmerer Resource Area Office. Approximately half the perennial streams in the area were included in this survey.

^{2/} Stream habitat trend for aquatic species (mainly trout) was determined by the channel stability rating, a measure of the degree to which erosion has progressed beyond a slow, natural process. Other factors that affect channel stability, and are included in the determination of trend, include: bank protection from vegetation, ungulate damage, beaver pond condition, head-cutting, and mass wasting. Based on these criteria, a stream with a channel stability rating of greater than 114 are already eroding at such a high rate that conditions are unlikely to get much worse. In these cases, a stream may have a stable trend rating, but have a riparian habitat condition rating of "poor" or "none".

^{3/} Riparian habitat condition was determined by a combination of its "bank protection from vegetation" and the width of the riparian zone. The bank protection factor was based on plant density, vigor, species composition, and diversity.

APPENDIX G

METHODOLOGIES FOR SOIL DETERMINATION

A. Well Impacts

Cumulative impacts of wells on the environment were assessed in terms of well years. For example, one well classified as a failure has a 6 well-year impact on the environment. Impacts for wells drilled prior to 1978 were assessed by summing the number of wells affecting the environment for each year (1978 through 1985 or 1978 through 2000). Impacts for projected wells were computed by multiplying the number of wells per year by the expected number of years of impact based on the well status (success or failure). In cases where the impacts would exceed the short-term or long-term timeframe, the multiplier was reduced to the number of years within the term. Cumulative impacts were determined by adding together the impacts for all wells.

Short-Term Cumulative Impacts of All Wells Drilled

Year	Wells Drilled Prior to 1978		Projected Wells Drilled After 1977		Well-Year Impacts for Projected Wells	
	Success	Failure	Success	Failure	Success	Failure
1978	77	79	30	33	240	198
1979	76	72	36	40	252	240
1980	76	67	41	47	246	282
1981	76	63	47	53	235	265
1982	74	53	53	60	212	240
1983	73	33	59	66	177	198
1984	72	0	64	73	128	146
1985	70	0	70	79	70	79
Totals	594	367	—	—	1,560	1,648

Previous Wells		Projected Wells	
Success	594	Success	1,560
Failure	367	Failure	1,648
Total	961	Total	3,208

Previous Wells 3,208 Well-Years
 Previous Wells 3,208 Well-Years
Total Impact 4,169 Well-Years

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Long-Term Cumulative Impacts of All Wells Drilled

Year	Wells Drilled Prior to 1978		Projected Wells Drilled After 1977		Well-Year Impacts for Projected Wells	
	Success	Failure	Success	Failure	Success	Failure
1978	77	79	30	33	690	198
1979	76	72	36	40	792	240
1980	76	67	41	47	861	282
1981	76	63	47	53	940	318
1982	74	53	53	60	1,007	360
1983	73	33	59	66	1,062	396
1984	72	0	64	73	1,088	438
1985	70	0	70	79	1,120	474
1986	68	0	70	79	1,050	474
1987	67	0	70	79	980	474
1988	66	0	70	79	910	474
1989	66	0	70	79	840	474
1990	66	0	70	79	770	474
1991	66	0	70	79	700	474
1992	66	0	70	79	730	474
1993	65	0	70	79	560	474
1994	65	0	70	79	490	474
1995	63	0	70	79	420	474
1996	63	0	70	79	350	395
1997	60	0	70	79	280	316
1998	53	0	70	79	210	237
1999	50	0	70	79	140	158
2000	40	0	70	79	70	79
Totals	2,479*	367	—	—	15,880	8,631

Previous Wells		Projected Wells	
Success	2,479*	Success	15,880
Failure	367	Failure	8,631
Total	2,846*	Total	24,511

* Includes 961 wells drilled previous to 1978 (see short-term cumulative impacts).

B. Soil Erosion Determinations

Soil erosion rates for drill pads in the Kemmerer Resource Area were calculated using the Musgrave equation. The equation, derived from BLM Manual 7317.22A is as follows:

$$E = FR (S/10)^{1.35} (L/72.6)^{0.35} (P/1.375)^{1.75}$$

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Where:

- E = sheet erosion in tons/acre/year
- F = basic erosion rate of bare soil in tons/year
- R = cover factor
- S = average slope of contributing area
- L = length of slope
- P = maximum 2-year frequency, 30-minute rainfall in inches

For Resource Area:

- F = 50
- R = 1
- S = 75 for Overthrust Belt, 50 east of Overthrust Belt
- L = 74.5 feet for Overthrust Belt, 81 feet east of Overthrust Belt
- P = .4

The soil erosion rate (E) calculated is:

- 90 tons/acre/year for the Overthrust Belt
- 55 tons/acre/year east of the Overthrust Belt

The amount of acreage contributing sediment from a drill pad is:

- 3 acres for the Overthrust Belt
- 2 acres east of the Overthrust Belt

Thus 270 tons/year/well is the soil erosion rate for the Overthrust Belt and 110 tons/year/well is the rate east of the Overthrust Belt.

These rates are then multiplied by the number of wells or well-year impacting the environment in order to determine total soil erosion.

Overthrust Belt		East Side	
398	wells	492	wells
x 270	tons/year/well	x 110	tons/year/well
107,460		54,120	

Total soil erosion = 161,580 tons in 1985

Cumulative soil erosion 1978-1985:

Overthrust Belt		East Side	
1,863	wells	2,308	wells
x 270	tons/year/well	x 110	tons/year/well
503,010		253,660	

Total cumulative soil erosion = 756,670 tons

C. Assumptions of Impacts Over the Long Term (1985 through 2000)

Proposed Action	Number of Proposed Miles	Width of Disturbance (Feet)	Total Acres Disturbed
Overthrust Belt			
Wildcat Roads	714	50	3,709
Field Well Roads	269	50	1,018
Eastern			
Wildcat Roads	909	32	2,936
Field Well Roads	343	32	807
Subtotal disturbance from roads			8,470

APPENDIX H

RECREATION POTENTIAL SITE RATINGS

The following inventory of the KRA's potential recreation sites has been compiled to illustrate the variety of recreational activities and development potential for each site. The sites have also been rated to show a priority for development. These sites have been determined to contain the most desirable resources for the recreationist to pursue a gratifying experience.

The sites in this appendix would be analyzed for development in a recreation area management plan (RAMP). These sites need to be protected for future recreationists because they exhibit the most desirable recreation potential. If development is anticipated in the future, the site would be analyzed in a RAMP.

Site Ratings

A = Essential to recreation management program (must protect - should develop)

B = Very important (must protect - should develop)

C = Important - (must protect - leave for dispersed use)

Facility Possibilities/Site

P = Picnicking

H = Hunting

F = Fishing

CU = Cultural

S = Snowmobiling

PW = Possible Water

FW = Firewood

I = Interpretive

V = Choice View

HR = Horseback Riding

Dempsey Ridge

1. Emigrant Springs - Sec. 26, T. 23 N., R. 118 W. - Historic campsite of the pioneers using the Sublette cutoff of the Oregon Trail. Today the area is heavily used for camping by hunters and sheepherders. Medium-sized site - C, P, H, CU, PW, FW, I. Site rating = A
2. Coke Mountain - Secs. 15 and 22, T. 24 N., R. 118 W. - Great view of the Bear River and Hams Fork drainages. Heavily used for camping, hunting, and firewood gathering. Easy access via the Dempsey Ridge Road. The site extends over the ridge towards the Hams Fork River and future development could be expanded in that direction if crowding becomes a problem on the ridge.

A small site at the present time. C, P, H, S, FW, V, HR. Site rating = A

3. Top of Bear Canyon - Sec. 25, T. 25 N., R. 118 W.; Sec. 30, T. 25 N., R. 117 W. - Two small sites that are very popular hunting and woodcutting areas that would be conducive to development. Moderate access via the Dempsey Ridge Road or through the Pine Creek area. A good place to construct facilities on a small scale and expand, as needed. Small site - C, P, H, FW. Site rating = B
4. Mayfield Creek - Sec. 24, T. 25 N., R. 118 W.; Secs. 18, 19, T. 25 N., R. 117 W. - A site similar to the top of Bear Canyon site. Heavily treed. Site rating = B or C

Upper Smiths Fork

1. Across-The-Bridge - Sec. 5 (SE¼), T. 27 N., R. 118 W. - Often used campsite in a quaking aspen grove. Heavily used during hunting season. Located just off Smiths Fork Road. Easy access, medium-sized site - C, P, H, F, PW, FW. Site rating = B
2. Dry Fork - Sec. 5 (NE¼, NE¼), T. 27 N., R. 118 W.; Sec. 32 (SE¼, SE¼), T. 28 N., R. 118 W. - Often used campsite in a quaking aspen grove with a large beaver pond. Heavily used during hunting season. Located just off Smiths Fork Road. Easy access, small site - C, P, H, F, PW, FW, possible I (beaver pond). Site rating = B
3. Hobble Creek - Sec. 34, T. 28 N., R. 118 W. - Very scenic. Campsite along Hobble Creek near Smiths Fork River. Heavily used during hunting season. Located about two miles off Smiths Fork Road near U.S. Forest Service boundary. An easement for 1-½ miles of private land will have to be obtained to develop this site. Moderate access, medium-sized site - C, P, H, F, W, FW, HR. Site rating = A
4. Trespass Creek - Sec. 3 and 10, T. 28 N., R. 118 W. - Exceptionally scenic camping area overlooking the Smiths Fork River. Heavily used during the summer and hunting

APPENDIX H

season. Located about one mile east of Smiths Fork Road near Forest Service boundary, four-wheel drive road for access. Large site - C, P, H, F, W, FW, HR. Site rating = A

Raymond Mountain WSA

Raymond Canyon - Sec. 4 - 6, T. 26 N., R. 119 W. - Exceptionally scenic canyon uniquely conducive to outdoor recreation. Several camping sites exist along the canyon terminating in a large meadow. The area is heavily used during the hunting season and is often used the rest of the year. Access to the canyon is barricaded and travel beyond the barricade is restricted to ORVs. Large site - C, P, H, F, W, FW, S, HR. Site rating = A

Commissary Ridge

The entire ridge - Secs. 3, 4, 9, 10, 15, 21, 22, 28, T. 24 N., R. 116 W. - The Commissary Ridge area has a high recreation potential rating, however, it is recommended that at this time the entire ridge remain undeveloped for dispersed use. Facility development is not expected to be needed in this area during the life of this plan. However, development of recreation facilities at this site would be in conformance with any of the alternatives considered. Therefore, the recreation potential should be maintained.

Some of the other high recreation potential areas display more of the resources desirable for developed recreation (e.g., streams or lakes). These other areas are more likely to be the first sites considered for developed recreation. Unless the foreseeable demand changes, Commissary Ridge would probably be developed after other sites. Developed recreation in this area could include campsites, picnic tables, toilets, and other associated facilities. Large site with easy access - C, P, H, FW, V. Site rating = C

Pine Creek

Pine Creek area - Secs. 23, 26, 34, 35, T. 25 N., R. 118 W. - A RAMP is currently being

prepared for the Pine Creek area. The area is very scenic and characterized by steep cliffs, a crystal clear spring-fed creek, and a developed ski area. Pine Creek is heavily used throughout the year. Access consists of a maintained county road to the ski area allowing easy travel into the area. The Pine Creek area abuts Dempsey Ridge, enhancing the recreation opportunities to both areas. Developments may include picnic tables, fire rings, etc. Large site - C, P, H, F, S, W, FW, I, V, HR. Site rating = A

Upper Hams Fork

1. Beaver Creek (south) - Secs. 33 - 34, T. 25 N., R. 116 W. - Access into Beaver Creek (south) from the Hams Fork Road is by four-wheel drive only. The area is characterized by thick forests, open parks, creeks, beaver ponds, and rolling hills. The site is heavily used by campers, hunters, and fishermen. Legal access into the area would have to be gained before development begins. Large site - C, P, H, F, S, W, FW, HR. Site rating = A
2. West Fork/Beaver Creek (north) - Sec. 28, T. 25 N., R. 116 W. - Same as Beaver Creek (south).

Meeks Cabin Area

It is recommended that BLM recreational development not be implemented in the Meeks Cabin area at this time. A U.S. Forest Service campground is located in Secs. 22 - 23, T. 12 N., R. 117 W. (on the lake) as well as a Uinta County campground about three miles north of the lake on the Blacks Fork River. Observations indicate that both sites are under-utilized. The checkerboard land ownership pattern in this area complicates access. Also, the total amount of BLM land in the area (about 10 checkerboard sections) is small as compared to the surrounding U.S. Forest Service and private holdings.

Although the area is not recommended for recreational development at this time, dispersed recreation use of the area should be encouraged and safeguarded. C, P, H, F, S, W, FW, HR. Site rating = C

Appendix I-1

TOTAL AUM AND RECREATION DAY LEVELS ON "I" ALLOTMENTS:
BEGINNING AND ENDING LEVELS BY ALTERNATIVE (1,000 Units)^{1/}

Alternatives	Annual Levels: AUMs ^{2/}		Resulting Change ^{3/4/}	Annual Levels: Recreation Days		Resulting Change ^{4/}
	Beginning	Ending		Beginning	Ending	
EM	162.00	163.27	+ 1.27	42.18	42.18	0
A	162.00	193.90	+ 31.90	42.18	45.93	+ 3.75
B	162.00	208.41	+ 46.41	42.18	31.20	-10.98
C	162.00	134.99	- 27.01	42.18	47.00	+ 4.82
D	162.00	39.57	-122.43	42.18	70.99	+28.81
E	162.00	193.90	+ 31.90	42.18	45.93	+ 3.75

^{1/} Data supplied by Kemmerer Resource Area range, recreation, and wildlife specialists.

^{2/} Presently leased AUMs total approximately 124,000.

^{3/} Based on changes specified for each alternative on Appendix A-2. These changes do not include lost opportunities for AUMs presently available but not being utilized.

^{4/} Figures in this column represent the total change between the beginning and ending annual levels. The given alternative determines how long it will take to make this change. Increases are estimated to have a transition period of 30 years and declines 10 years.

Appendix I-3

PRESENT VALUE OF BENEFIT AND COSTS BY ALTERNATIVE
AND RESULTING BENEFIT/COST RATIOS

Subject	Unit	EM	A	B ^{2/}	C	D ^{3/}	E
Benefits	\$1,000	279.72	2,625.87	2,924.20	1,394.78	3,318.42	2,265.87
Costs	\$1,000	277.89	1,595.18	2,543.06	1,005.46	None	1,595.18
Net PV	\$1,000	1.83	1,030.69	5,467.26	389.32	3,318.42	1,039.69
Benefit/Cost	Ratio	1.01	1.65	-1.15	1.39	None	1.65

^{1/} Analysis prepared by Kemmerer Resource Area range specialist, Dave Henderson.

^{2/} Low levels of future benefits from this alternative resulted in negative numbers when discounted to present value using the 8.125 percent discount rate dictated by the Water Resource Council. These negative benefits, when compared to positive benefits of other alternatives, are a cost to the public. Therefore, for this alternative, benefits are added by the program to the general cost of Alternative B to arrive at a total cost to the public of over \$5 million and a subsequent negative benefit cost ratio greater than 1.

^{3/} The assumption has been made by the KRA that under this alternative there would be no public costs related to livestock management in the Area. Therefore, only benefits accruing to recreation activities are included. Without costs, no B/C ratio can be calculated.

APPENDIX I-2

LONG-TERM ECONOMIC IMPACTS OF PROPOSED "I" ALLOTMENT MANAGEMENT PRACTICES ON SELECTED ECONOMIC SECTORS¹

	Unit of Measure	Existing Management		Alternative A ²¹		Alternative B		Alternative C		Alternative D		Alternative E ²¹	
		Total Change	Average Annual Change	Total Change	Average Annual Change	Total Change	Average Annual Change	Total Change	Average Annual Change	Total Change	Average Annual Change	Total Change	Average Annual Change
		(30 yrs) ²⁰	Change	(30 yrs) ²⁰	Change	(30 yrs) ²⁰	Change	(10 yrs) ²⁰	Change	(10 yrs) ²⁰	Change	(10 yrs) ²⁰	Change
Livestock Sector													
Change in Livestock AUMs ²	1,000 AUMs	1.27	.04	31.90	1.06	46.41	1.55	-27.01	-2.7	-122.43	-12.24	31.90	1.06
Direct Change in Range Income ³	\$1,000	5.28	.18	132.70	4.42	193.07	6.44	-261.20	-26.12	-1,183.87	-118.39	132.70	4.42
Direct Change in Livestock Sales ⁴	\$1,000	21.55	.72	541.66	18.05	788.04	26.27	-580.20	-58.02	-2,629.73	-262.97	541.66	18.05
Indirect and Induced Business Impacts ⁵	\$1,000	22.91	.76	575.89	19.20	837.84	27.93	-616.87	-61.69	-2,795.93	-279.59	575.89	19.20
Total Business Impacts ⁶	\$1,000	44.46	1.48	1,117.55	37.25	1,625.80	54.20	-1,197.07	-119.71	-5,425.66	-542.56	1,117.55	37.25
Total Change in Regional Income ⁷	\$1,000	20.57	.69	517.11	17.24	752.36	25.08	-1,017.84	-101.78	-4,613.30	-461.33	517.11	17.24
Direct Change in Agricultural Employment ⁸	Actual No	23	.01	5.76	.19	8.38	.28	-6.17	-.62	-27.95	-2.80	5.76	.19
Indirect and Induced Employment Change ⁹	Actual No	26	.01	6.57	.22	9.56	.32	-7.04	-.70	-31.93	-3.19	6.57	.22
Total Change in Regional Employment ¹⁰	Actual No	49	.02	12.33	.41	17.94	.60	-13.21	-1.32	-59.88	-5.99	12.33	.41
Recreation and Wildlife Sector													
Change in Recreation Days ¹¹	1,000 days	190	190	3.75	.12	-10.98	-.37	4.82	.48	28.81	2.88	3.75	.12
Direct Change in Expenditures ¹²	\$1,000	0	0	145.68	4.86	-426.68	-14.22	187.24	18.72	1,119.96	112.00	145.68	4.86
Indirect and Induced Business Impacts ¹³	\$1,000	0	0	169.40	5.64	-496.13	-16.54	217.72	21.77	1,302.29	130.23	169.40	5.64
Total Business Impacts ¹⁴	\$1,000	0	0	315.08	10.50	-922.81	-30.76	404.96	40.49	2,422.25	242.23	315.08	10.50
Direct Change in Recreational Employment ¹⁵	Actual No	0	0	6.05	.20	-17.72	-.59	7.77	.78	46.50	4.65	6.05	.20
Indirect and Induced Employment Change ¹⁶	Actual No	0	0	1.32	.04	-3.87	-.13	1.70	.17	10.17	1.02	1.32	.04
Total Change in Regional Employment ¹⁷	Actual No	0	0	7.37	.24	-21.59	-.72	9.47	.95	56.67	5.67	7.37	.24
Total of Above Changes¹⁸													
Total Change in Livestock Sales and Recreation Expenditures	\$1,000	21.55	.72	687.34	22.91	361.36	12.05	-392.96	-39.30	-1,509.77	-150.98	687.34	22.91
Indirect and Induced Business Impacts	\$1,000	22.91	.76	745.29	24.84	341.71	11.39	-399.15	-39.91	-1,493.64	-149.36	745.29	24.84
Total Business Impacts	\$1,000	44.46	1.48	1,432.63	47.75	703.07	23.44	-792.11	-79.21	-3,003.41	-300.34	1,432.63	47.75
Direct Change in Regional Employment	Actual No	23	.01	11.81	.39	-9.34	-.31	1.60	.16	18.55	1.85	11.81	.39
Indirect and Induced Employment Change	Actual No	26	.01	7.89	.26	5.69	.19	-5.34	-.53	-21.76	-2.17	7.89	.26
Total Change in Regional Employment	Actual No	49	.02	19.70	.65	-3.65	-.12	-3.74	-.37	-3.21	-.32	19.70	.65

¹ Figures represent total changes on "I" allotments for Federal, State, and private grazing lands. They assume that the economic interrelationships do not change over the time span of the analysis. The dollar figures are not adjusted for possible future inflation, nor are they reduced to present values. They are intended only to present the comparative relationship between alternatives as expressed in current 1984 dollars.

² As shown in Appendix A-2, existing AUMs on Federal, State, and private grazing lands in the "I" allotments total 204,211. Comparable AUMs on the total KRA equal 282,982. The 204,211 level is the base from which AUM changes were measured for each alternative on this table and all other calculations on this table have their basis in the AUM changes. Changes listed do not include lost opportunities for AUMs presently available but not utilized.

³ A figure of 4.16 was multiplied times any AUM increases and 9.67 times any AUM decreases to arrive at these figures. Methodology was derived from the linear programming models for the Salt Wells Pilot Butte Grazing EIS.

⁴ Figures derived by multiplying 16.98 times any specified AUM increases, or 21.48 times any AUM declines. Methodology was derived from the linear programming models for the Salt Wells Pilot Butte Grazing EIS. Table 3-20 shows cash receipts to the agricultural sector from marketing meat animals totaled over \$24 million in 1981 in the three-county area of the KRA.

⁵ Equals the results of subtracting the direct change in livestock sales from the total business impacts specified here for the livestock sector.

⁶ Derived by multiplying the change in livestock sales times 2.0632. This is a Type II multiplier that treats households as endogenous to the production sector. This multiplier equals the dollars of business activity generated in the region per dollar delivered to final demand (McKean, 1983, p. 25).

⁷ Derived by multiplying the direct change in ranch income times the Type II Income Multiplier 3.8968 (McKean, 1983, p. 28). It represents dollars of income generated per dollars of direct income paid to households.

⁸ Multiplier is 0.01063 per \$1,000 of livestock sales specified above (McKean, 1983, p. 31).

⁹ These changes are derived by subtracting the direct change in employment from the total change in employment calculated for this livestock sector.

¹⁰ These figures include direct, indirect, and induced changes in employment. The applied multiplier was 0.02277 per \$1,000 of changes in livestock sales listed above (McKean, 1983).

¹¹ Information supplied by Wyoming Game and Fish Department for BLM Kemmerer Resource Area. These figures include recreation days only for antelope, deer, elk, and moose and represent changes resulting from livestock management activities proposed for each of the alternatives. These figures are not comparable with total recreation day figures presented in Table 3-14. The present recreation day level experienced on "I" allotments is the base against which changes are measured.

¹² These figures result from multiplying the change in recreation days by a regional recreation day value of \$38.87 that is derived from methodology presented in Washington Information Memo. 83-27, October 15, 1982.

¹³ Equals total business impacts minus direct changes in recreation/wildlife expenditures specified above.

¹⁴ Derived by applying Type II multiplier 2.1628 times the change in recreation/wildlife expenditures. This is a retail trade multiplier and is an average of multipliers specified for items 19, 20, 24, and 25 on Page 25 of Tech. Report No. 40. This multiplier equals the dollars of business activity generated in the region per dollar to final demand in the recreation/wildlife sector of the economy.

¹⁵ Derived by applying a multiplier of 0.0415 per \$1,000 of recreation/wildlife expenditures. Source is Tech. Report No. 40, Page 31, the averaged of items 19, 20, 24, and 25.

¹⁶ Result of subtracting the direct employment figures from the total regional employment figures calculated in this sector.

¹⁷ These figures include direct, indirect, and induced employment. Derived by applying a multiplier of 0.0506 per \$1,000 of recreation/wildlife expenditures. Source of multiplier is Tech. Report No. 40, Page 31, the average of items 19, 20, 24, and 25.

¹⁸ The figures in this section are net totals of the figures in the two sectors above.

¹⁹ Zeros appear for the recreation/wildlife sector under the Existing Management alternative because no changes from present levels were projected for recreation days in "I" Allotments under this alternative.

²⁰ Year indicates estimated length of time for total changes indicated below to be realized. This column shows the total changes over that time period. Once these changes have occurred, the economy is estimated to stabilize at the new equilibrium position for the remainder of the plan period or until some new activity causes renewed adjustments.

²¹ Kemmerer Resource Area specialists are assuming that impacts to livestock AUMs and recreation days would be the same for Alternatives A and E. As a result, impacts to other items under these alternatives are also the same.

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